# Stock opp aff v2

## Framework

#### First, the purpose of debate education should be to train youth to challenge oppressive structures, not perpetuate them,

Bohmer 91 “Teaching Privileged Students about Gender, Race, and Class Oppression.” Teaching Sociology, Vol. 19, No. 2 (April, 1991) pp. 154-163.

Our [a] strong emphasis on institutional oppression is not only due to our sociological approach to social psychology; it is also an outcome of our interactions with students. Let us repeat that most[ly] of our students are white and middle class [students], with limited exposure to group diversity. Much of the material we present is new to them and often difficult to absorb. One of their major problems lies in moving from individualistic explanations to a sociological analysis.Teaching in this setting, we have found that **a focus on micro-level processes is fruitful only after we have addressed** the concept of **institutional oppression. Without an understanding** of institutional aspects **students** decontextualize social interactions; they **equate prejudice with oppression and argue that members of privileged groups are also oppressed.** This position, of course, is untenable if we want the concept to remain useful for an analysis of class, race, and gender relations **in** our society. Even while we emphasize institutional barriers for members of oppressed groups, we do not deny human agency by portraying oppressed individuals as trapped entirely by the confines of society. Balancing the two perspectives, however, is difficult, and the outcome depends strongly on our audience. With primarily white, middle-class students, who tend to advance individualistic explanations and who seem largely unaware of the institutional nature of oppression, we believe it is appropriate to stress barriers and limitations. If we taught a more diverse population we are certain that our discussion of oppression would focus more sharply on human agency as a potential for change. It can be both trying and challenging to integrate considerations of race, gender, and class into an introductory course on social psychology. We have experienced resistance, guilt, anger, and denial from many of our privileged students. Our greatest frustration is that students are reinforced in their resistance and denial because they experience little follow-up in other classes and have little ongoing exposure to the concepts we have introduced. We believe, however, that **exposure to the concept of oppression** in ou r classes **helps** at leastsome **students** to **gain a greater understanding** and appreciation **for those who are different** from themselves. **Such exposure also leads** some **students to raise questions in other courses** that do not take race, gender, and class into account.These students, who we hope will **apply their knowledge to their everyday interactions with members of other groups**, [and] encourage us to find new ways of introducing race, gender, and class into the sociology curriculum.

#### Second, structural violence excludes certain individuals from the moral sphere, meaning it’s impossible to create a coherent moral code without resolving issues of structural violence

#### Third, Ideal theory ignores histories of injustice in its attempt to generalize a perfect society. Non Ideal theory is the only option to recognize and resist recreating injustice

Mills 2“Ideal Theory” as Ideology CHARLES W. MILLS

The crucial common claim—whether couched in terms of ideology and fetishism, or androcentrism, or white normativity—is that all theorizing, both moral and nonmoral, takes place in an intellectual realm dominated by concepts, assumptions, norms, values, and framing perspectives that reflect the experience and group interests of the privileged group (whether the bourgeoisie, or men, or whites). So a simple empiricism will not work as a cognitive strategy; one has to be self-conscious about the concepts that “spontaneously” occur to one, since many of these concepts will not arise naturally but as the result of social structures and hegemonic ideational patterns. In particular, it will often be the case that dominant concepts will obscure certain crucial realities, block- ing them from sight, or naturalizing them, while on the other hand, concepts necessary for accurately mapping these realities will be absent. Whether in terms of concepts of the self, or of humans in general, or in the cartography of the social, it will be necessary to scrutinize the dominant conceptual tools and the way the boundaries are drawn. This is, of course, the burden of standpoint theory—that certain realities tend to be more visible from the perspective of the subordinated than the privileged (Harding 2003). The thesis can be put in a strong and implausible form, but weaker versions do have considerable plausibility, as illustrated by the simple fact that for the most part the crucial conceptual innovation necessary to map nonideal realities has not come from the dominant group. In its ignoring of oppression, ideal theory also ignores the consequences of oppression. If societies are not oppressive, or if in modeling them we can abstract away from oppression and assume moral cognizers of roughly equal skill, then the paradigmatic moral agent can be featureless. No theory is required about the particular group-based obstacles that may block the vision of a particular group. By contrast, nonideal theory recognizes that people will typically be cognitively affected by their social location, so that on both the macro and the more local level, the descriptive concepts arrived at may be misleading.

#### Fourth, discussions cannot be based on ideal theory- we must engage in real world discussions but those discussions mean nothing unless they change the values to the people they affect,

Curry 14 Dr. Tommy J. Curry 1 The Cost of a Thing: A Kingian Reformulation of a Living Wage Argument in the 21st Century. 2014

**Despite the pronouncement of debate as an activity and intellectual exercise pointing to** the **real world consequences** of dialogue, thinking, and (personal) politics when addressing issues of racism, sexism, economic disparity, global conflicts, and death, **many of the discussions** concerning these ongoing challenges to humanity **are fixed to a paradigm which sees the adjudication of material disparities** and sociological realities **as the conquest of one ideal theory over the other.** In “Ideal Theory as Ideology,” Charles Mills outlines the problem contemporary theoretical-performance styles in policy debate and value-weighing in Lincoln-Douglass are confronted with in their attempts to get at the concrete problems in our societies. At the outset, Mills concedes that “ideal theory applies to moral theory as a whole (at least to normative ethics as against metaethics); [s]ince ethics deals by definition with normative/prescriptive/evaluative issues, [it is set] against factual/descriptive issues.” [i] At the most general level, the conceptual chasm between what emerges as*actual*problems in the world (e.g.: racism, sexism, poverty, disease, etc.) and how we frame such problems *theoretically*—the assumptions and shared ideologies we depend upon for our problems to be heard and accepted as a worthy “problem” by an audience—is the most obvious call for an anti-ethical paradigm, since such a paradigm insists on the actual as the basis of what can be considered normatively. Mills, however, describes this chasm as a problem of an ideal-as-descriptive model which argues that for any actual-empirical-observable social phenomenon (P), an ideal of (P) is necessarily a representation of that phenomenon. In the idealization of a social phenomenon (P), one “necessarily has to abstract away from certain features” of (P) that is observed before abstraction occurs. **This gap between what is***actual*(**in the world**), a**nd what is represented by theories and politics of debaters** proposed in rounds **threatens any real discussions about the concrete nature of oppression and** the racist economic structures which necessitate **tangible policies and reorienting changes in our value orientations.** As Mills states: “What distinguishes ideal theory is the reliance on idealization to the exclusion, or at least marginalization, of the actual,”[i] so what we are seeking to resolve on the basis of “thought” is in fact incomplete, incorrect, or ultimately irrelevant to the actual problems which our “theories” seek to address. **Our attempts to situate social disparity cannot** simply appeal to the ontologization of social phenomenon—meaning we cannot **suggest that the various complexities of social problems** (which are constantly emerging and undisclosed beyond the effects we observe) **are totalizable by any one set of theories within an ideological frame** be it our most cherished notions of Afro-pessimism, feminism, Marxism, or the like. At best, theoretical endorsements make us aware of sets of actions to address ever developing problems in our empirical world, but even this awareness does not command us to*only*do X, but rather do X and the other ideas which compliment the material conditions addressed by the action X. As a whole, debate (policy and LD) neglects the need to do X in order to remedy our cast-away-ness among our ideological tendencies and politics. How then do we pull ourselves from this seeming ir-recoverability of thought in general and in our endorsement of socially actualizable values like that of the living wage? It is my position that Dr. Martin Luther King Jr.’s thinking about the need for a living wage was a unique, and remains an underappreciated, resource in our attempts to impose value reorientation (be it through critique or normative gestures) upon the actual world. In other words, King aims to reformulate the values which deny the legitimacy of the living wage, and those values predicated on the flawed views of the worker, Blacks, and the colonized (dignity, justice, fairness, rights, etc.) used to currently justify the living wages in under our contemporary moral parameters.

#### Thus only questions of social identity in the context of value reorientation are possible to gain offense or solvency.

#### This requires state action, not just critical reflection- moving away from the state dooms the lefts’ critique to failure—we must work within the state without being statist, meaning if the neg alt isn’t a state policy I’m the only one with a risk of offense

Connally 2k8 [William, Professor of Political Science at John Hopkins, Capitalism and Christianity, American Style, page numbers are at the bottom of the card.]

Before turning to possible strategies to promote these objectives, we need to face an objection posed by one segment of the left: "Don't you depend a lot upon the state, when it must be viewed as the enemy?" My response is threefold. First, there is no way to take on global warming without engaging the state in the effort as well as international agencies, and global warming is a key danger of this epoch. Second, **it is less the state** itself**and more its** existing **subsidies** and priorities that are at issue. If you were to oppose both the market and the state **you** might **reduce the** democratic **left to pure critique, with no** presentation of positive **possibilities and strategies**. But **critique is always important and never enough**, as the left has begun to rediscover and as the American right has known for forty years. Third, although **one must acknowledge** the issues of cumbersome state **bureaucracy**, corporate cronyism, **and** state **corruption**, all three increased radically when the evangelical-capitalist resonance machine achieved hegemony, and **they will get worse unless eco-egalitarians enter the fray at the interceded levels of micropolitics, microeconomic experiments, and the state**. It is unwise to act as if the state must always be what it has become. Challenging the media is critical in this respect, making it become a watchdog of corporations, the state, religious movements, and the multiple imbrications between them. My view, as becomes clear in the next few pages, is that **no** interim **agenda on the left can proceed far without finding expression in state policy,** and state policy must draw inspiration from microeconomic experiments initially launched outside its canopy: microeconomic experiments and creative state policies must inform each other.**We** thus **seek to include the state without becoming statist.** Those who invest hope in revolutionary overthrow may oppose such a combination. I suspect that revolution, were it to occur, would undermine rather than vitalize democratic culture.29

#### Thus the advocacy is that countries ought to prohibit the production of nuclear power. Plan passes through normal means, I reserve the right to clarify in CX.

## Contention 1: Indigenous Sovereignty

#### The nuclear power industry has set their aim on cultivating indigenous land – utilizing coercion to exploit and control natives in yet another wave of colonialism

Angel 91 Bradley (an international leader in the environmental health and justice movement, working with communities to stop pollution threats and to promote pollution prevention) “The Toxic Threat to Indian Lands” Greenpeace 1991 <http://www.ejnet.org/ej/toxicthreattoindianlands.pdf> DOA: 8.11.16//KAE

Five hundred years ago explorer Christopher Columbus sailed from Europe, setting in motion a series of events leading to the genocidal war on Indigenous people in whose land he arrived uninvited. Hoping to claim these already inhabited lands for European royalty, invading European armies plundered the civilizations they came upon. Untold millions of Indigenous people were killed and enslaved, their cultures violently attacked and their way of life changed forever. Five hundred years later, the exploitation and assault on Indigenous people and their land continues. Instead of conquistadors armed with weapons of destruction and war, the new assault is disguised as “economic development” promoted by entrepreneurs pushing poisonous technologies. The modern day invaders from the waste disposal industry promise huge amounts of money, make vague promises about jobs, and make exaggerated and often false claims about the alleged safety of their dangerous proposals. Frustrated by intense grassroots opposition and complex permitting procedures in other communities across the United States, the waste disposal industry and **the U.S.** government **have set their aim on what they believe to be the most vulnerable segment of society:** Indian people and **Indian land.** Today, hundreds of Indian Nations (Tribes) are being approached by both the waste disposal industry and the United States Government in search of new dumping grounds for the unwanted toxic, nuclear, medical and solid waste of industrial society. Hoping to take advantage of the devastating chronic unemployment, pervasive poverty and sovereign status of Indian Nations, the waste disposal industry and the U.S. government have embarked on an all-out effort to site incinerators, landfills, nuclear waste storage facilities and similar polluting industries on Tribal land. The waste industry strenuously denies that they are targeting Indian lands, and U.S. Environmental Protection Agency and Bureau of Indian Affairs officials downplay and underestimate the extent of industry’s efforts: the facts, however, contradict the waste industry’s claims and instead **reveal a concerted effort to turn Indian lands into the dumping grounds for America’s poisons.** Established companies such as Bechtel and Waste Tech (a subsidiary of Amoco Oil) have been joined by fly-by-night operators hoping to get rich quick **by turning the last remaining land still controlled by Indian people into America’s new dumping ground.** For example, lawyers for Bechtel have approached numerous tribes offering everything from hazardous and solid waste to nuclear waste dumps to nuclear power plants. A Waste Tech representative even admitted publicly during a meeting on the Kaibab-Paiute Reservation (located near the Arizona-Utah border) that their company hoped to site five commercial hazardous waste incinerators on five geographically distinct Indian Reservations in the United States. Waste Tech has publicly admitted to contacting about 15 tribes as of mid-1990, according to Ted Bryant, a Choctaw Cherokee Indian who is a middle man in some of the deals involving Waste Tech (reported in the St. Louis Post Dispatch, July 15, 1990). The overtures of the waste industry initially succeeded in making inroads with numerous tribal officials and governments. Many agreements were signed between company and tribal officials giving the initial go-ahead for proposed waste disposal facilities, usually without the knowledge or consent of the Tribal membership. As the truth about the serious threats posed by these projects to the peoples health, environment, culture, traditions and sovereignty becomes known, resistance by Indian people has spread rapidly.

#### Implications: A) sovereignty is harmed through the coercion practices – this is a prereq to the generic environment impacts B) nuclear energy will maintain control over indigenous freedom if not eradicated through prohibition

#### Aboriginals and indigenous peoples face similar discrimination

Green 16 Radioactive waste and the nuclear war on Australia's Aboriginal people Jim Green 1st July 2016 <http://www.theecologist.org/News/news_analysis/2987853/radioactive_waste_and_the_nuclear_war_on_australias_aboriginal_people.html> Dr James "Jim" Green is the national [anti-nuclear](https://en.wikipedia.org/wiki/Anti-nuclear) campaigner with [Friends of the Earth Australia](https://en.wikipedia.org/wiki/Friends_of_the_Earth_Australia) and Australian coordinator of the [Beyond Nuclear](https://en.wikipedia.org/wiki/Beyond_Nuclear) Initiative.[1] Green is a regular media commentator on nuclear waste issues.[2] He has an honours degree in public health from the [University of Wollongong](https://en.wikipedia.org/wiki/University_of_Wollongong) and was awarded a PhD in [science and technology studies](https://en.wikipedia.org/wiki/Science_and_technology_studies) for his analysis of the [Lucas Heights](https://en.wikipedia.org/wiki/High_Flux_Australian_Reactor) research reactor debates.[3]

This isn't the first time that Aboriginal people in South Australia have faced the imposition of a national nuclear waste dump. In 1998, the federal government announced its intention to build a dump near the rocket and missile testing range at Woomera. The proposed dump generated such controversy in South Australia that the federal government hired a public relations company. [Correspondence](http://www.foe.org.au/anti-nuclear/issues/oz/nontdump/mw) between the company and the government was released under Freedom of Information laws. In one exchange, a government official asked the PR company to remove sand-dunes from a photo to be used in a brochure. The explanation provided by the government official was that: "Dunes are a sensitive area with respect to Aboriginal Heritage". The sand-dunes were removed from the photo, only for the government official to ask if the horizon could be straightened up as well. Aboriginal groups were coerced into signing 'Heritage Clearance Agreements' consenting to test drilling of short-listed sites for the proposed dump. The federal government made it clear that if consent was not granted, drilling would take place anyway. Aboriginal groups were put in an invidious position. They could attempt to protect specific cultural sites by engaging with the federal government and signing agreements, at the risk of having that engagement being misrepresented as consent for the dump; or they could refuse to engage in the process, thereby having no opportunity to protect cultural sites. Aboriginal groups did participate in Heritage Clearance Agreements, and as feared that participation was repeatedly misrepresented by the federal government as amounting to Aboriginal consent for the dump. 'We would not do that for any amount of money' In 2002, the Federal Government tried to buy-off Aboriginal opposition to the dump. Three Native Title claimant groups - the Kokatha, Kuyani and Barngala - were [offered](http://www.theage.com.au/articles/2003/05/16/1052885400359.html) A$90,000 to surrender their native title rights, but only on the condition that all three groups agreed. The government's offer was refused. Dr Roger Thomas, a Kokatha Traditional Owner, [said](http://www.theage.com.au/articles/2003/05/16/1052885400359.html): "The insult of it, it was just so insulting. I told the Commonwealth officers to stop being so disrespectful and rude to us by offering us $90,000 to pay out our country and our culture." Andrew Starkey, also a Kokatha man, [said](http://www.theage.com.au/articles/2003/05/16/1052885400359.html): "It was just shameful. They were wanting people to sign off their cultural heritage rights for a minuscule amount of money. We would not do that for any amount of money." In 2003, the federal government used the Lands Acquisition Act 1989 to seize land for the dump. Native Title rights and interests were extinguished with the stroke of a pen. This took place with no forewarning and no consultation with Aboriginal people.

#### Prohibiting production of nuclear power solves; eliminates the need for waste disposal and

Rozman 14 Izzati (Scholar and Author) “ARGUMENTATIVE REPORT SHOULD OR SHOULD NOT NUCLEAR POWER ENERGY BE BANNED GLOBALLY?” University Sultan Zainal Abidin, 2014 <https://www.academia.edu/10107346/ARGUMENTATIVE_REPORT_SHOULD_OR_SHOULD_NOT_NUCLEAR_POWER_ENERGY_BE_BANNED_GLOBALLY> DOA: 8.11.16//KAE

Nuclear power should be banned globally not because of the availability of extensive reasons that can always be put at dispute whenever the issue is being debated, but strictly because upon the rationality that the proliferation of nuclear power program in harboring nuclear energy for the industrialization purposes is indeed dangerous and risky by putting human being, open environment as well as civilization in a precarious state. The threat of uranium mining, health deterioration due to radioactive exposure and high scale impact of industrial accident and catastrophe risk is all the potential colossal damaging threats that would cease the entire human civilization, putting the innocent lives at stake should be banned globally (Maclellan, 2014). The threat of uranium mining The danger of uranium mining over the years deftly covers explicit issues which remain underneath the discussion partly because of the nature of the process itself and the precarious unease it bring upon the subject. The upshots of uranium mining blatantly destroy the livelihood of indigenous people, depleting precious potable water resources and bring hazardous effect towards human and environment.

## Contention 2: Nuclear racism

#### Nuclear power industry created a racial class in their labor markets – the buraku workers wouldn’t have existed without the means of production that the aff attempts to avoid. Now they lack the adequate government protection.

Shrader-Frechette 2 ENVIRONMENTAL JUSTICE Volume 5, Number 3, 2012 a Mary Ann Liebert, Inc. DOI: 10.1089/env.2011.0045 Nuclear Catastrophe, Disaster-Related Environmental Injustice, and Fukushima, Japan: Prima-Facie Evidence for a Japanese ‘‘Katrina’’ Knristin Shrader-Frechette [http://www3.nd.edu/~kshrader/pubs/ksf-ej-2012-fukushima.pdf //](http://www3.nd.edu/~kshrader/pubs/ksf-ej-2012-fukushima.pdf%20//) KAE

Because Japan has few minorities, one might expect that its environmental-injustice (EI) threats are rare. This article suggests they are not rare. It also shows that prima-facie evidence for EI arises not only because of siting noxious or polluting facilities in poor or minority communities, but also because of racism and classism that cause disaster-related environmental injustice (DREI)—like that occurring after Hurricane Katrina. Using the 2011 Japanese Fukushima-Daiichi nuclear disaster (FD) as a preliminary case study— despite the limits of available, ultima-facie information about FD harms—the article argues for four claims. (1) Before the FD accident, prima-facie evidence shows that poor people, ‘‘black’’ (buraku) blue-collar workers, and children were EI victims whose poverty and powerless caused them to accept the risky FD siting. (2) Before the accident, prima-facie evidence likewise shows that these same EI victims bore higher medical risks because of allowable FD radiation releases. (3) Post-accident, prima-facie evidence reveals that government failed to adequately assist or evacuate children and poor people living near the plant, and also harmed nearby children, poor people, and buraku by weakening radiation standards. (4) Post-accident, prima-facie evidence also suggests that government and industry have covered up many radiation risks and failed to provide EI-victim involvement in FD-related cleanup and decision making. The article closes with suggestions for further research that is able to assess the ultima-facie case for FD EI.

#### Nuclear power production created a new wave of the apartheid – created marginalized exclusion and social oppression against nation’s most vulnerable populations

Chen 11 The Radioactive Racism Behind Nuclear Energy At every point in the nuclear production chain, the industry has sloughed a disproportionate share of the risk on marginalized communities. [Michelle Chen](http://www.colorlines.com/writers/michelle-chen) MAR 23, 2011 http://www.colorlines.com/articles/radioactive-racism-behind-nuclear-energy

Today, in the shadow of Fukushima, the African continent's [one nuclear power plant](http://en.wikipedia.org/wiki/Koeberg_Nuclear_Power_Station), near Cape Town, is no longer a symbol of South Africa's relative industrial advancement. Rather, it is an emblem of a ruthless pursuit of new fuel at the public's expense. Under the government's energy program, designed to wean the country of its current dependency on coal, nuclear power will grow to about 23 percent of new energy generated by 2031, from just 2 percent in 2009, [according to Bloomberg](http://www.businessweek.com/news/2011-03-17/s-africa-commits-to-nuclear-power-as-china-halts-expansion.html). Advocates for the poor, women and other disenfranchised communities say the environmental harms of nuclear power will aggravate the social inequalities that persist despite the end of apartheid. In an email from Cape Town, Muna Lakhani, co-coordinator of [Earthlife Africa's Unplug Nuclear Campaign](http://www.earthlife.org.za/?p=1523), told Colorlines that the government's new nuclear agenda "was received with shock by civil society and labour formations" and amounted to "effectively an 'up yours' response to the citizens of our country": One would think that the South African government would pause for a moment, in the aftermath of the ongoing nuclear catastrophe at Fukushima in Japan, about committing us to a nuclear future.... Effectively, this message says to all of us: 1) we do not care about your health and safety; 2) we would rather support and pay for foreign technologies than develop local industry; 3) we would rather pay foreign workers than generate more jobs in South Africa; 4) we do not care that we will be responsible for poisoning Mother Africa for hundreds of thousands of years. In the coastal region of Bantamsklip, [plans to site a nuclear reactor](http://www.guardian.co.uk/world/2009/jul/24/nuclear-power-south-africa) have sparked a [passionate campaign](http://www.savebantamsklip.org/place.php) to protect the area's wildlife and local communities. South Africa's nuclear dreams fall on a [historical trajectory](http://etd.auburn.edu/etd/handle/10415/420) stretching from imperialism to modern-day resource exploitation. Decades ago, South Africa led the continent in nuclear development and capitalized on its native uranium stores. Although today South Africa is ignored in the geopolitical discourse on non-proliferation, nuclear power is entwined in roots of [apartheid and its massive security state](http://www.guardian.co.uk/world/2010/may/23/israel-south-africa-nuclear-weapons). [David Fig](http://www.democracynow.org/2011/3/16/south_africans_question_push_to_go), author of "Uranium Road: Questioning South Africa's Nuclear Direction," broke down the country's atomic evolution on "Democracy Now!": South Africa had a lot of uranium. And so, the first time that we were integrated into the world nuclear industry was through providing uranium to the bomb programs of your country, the United States, and Britain, in the '40s and '50s. And then, as prizes, we were given research reactors by President Eisenhower. And later, during apartheid, the world turned a blind eye while we made nuclear weapons. And so, the nuclear energy industry was just a smokescreen, in a way, for arming apartheid during the Cold War.

## Contention 3: symbolism

#### Nuclear power personifies a male structure perpetuating forms of masculine domination

Caputi 04, Jane Goddesses and Monsters: Women, Myth, Power, and Popular Culture <https://books.google.com/books/about/Goddesses_and_Monsters.html?id=C_r6meksRjUC&printsec=frontcover&source=kp_read_button#v=onepage&q=nuclear&f=false> 2004

Feminist criticism has focused on exposing what Diana Russell (1989) calls “nuclear phallacies” (fig. 10.1). Carol Cohn (1987) critiques the pervasively pornographic imagery and language of nuclear strategists. Feminist theologian Mary Condren (1989, 20I) avers: “Nuclear destruction is intrinsic to the spirituality and theology generated by Western culture.” Monica Sjoo and Barbara Mor (1991, 316) concur: “We suggest that the atomic or nuclear blast is man’s final identification with the Sun God, the final annihilation of matter/mother-and that this is the ultimate goal of all patriarchal religion.” The scientific quest that led to the development of nuclear technology was characterized by intense desire to split the atom, to break what the Cherokee thinker Marilou Awiakta (1986) understands as the “mother heart of the universe.” For about two centuries, split, and implicitly violent term, has served in “low slang” as a synonym for “copulate…as in…’I’d like to split that one’” (Beale, 1989, 424). The environmental historian Caroline Merchant (1980) has traced the implicit sexual violence of the seventeenth century scientific revolution as revealed through its characteristic metaphors of “mastering”, “disrobing,” and “penetrating” nature, understood as a female form. All such sexually violent imagery historically has marked nuclear metaphor. Atomic scientists are figured as investigating “the most intimate properties of matter”, “penetrating hidden mysteries, “tearing away veils to reveal inner secrets, and laying bare the structure of atoms. One scientist told of his “satisfaction in smashing a resistant atom” (Weart, 1989, 58). Once that defiant atom was smashed and split, the resulting bomb at first was conceptualized as male. The original scientists working at Los Alamos took bets among themselves as to whether they would ultimately have a “boy” or a “girl”- that is, a success or a dud. A success it was: The bomb dropped on Hiroshima was called “Little Boy.” In 1945 the War Department historian-journalist William L. Laurence won much acclaim for his eyewitness accounts of the first bomb blasts, which double as descriptions of a pornographic “come shot”, glorying in the spectacle of male ejaculation: “The mushroom top was even more alive than the pillar, seething and boiling in a white fury of creamy foam, sizzling upward and then descending earthward, a thousand geysers rolled into one” (1946, 239). A canny awareness of the sexual and sexually violent dimensions of nuclear imagery and practice unforgettably informs Stanley Kubrick’s riotous 1963 film, *Dr. Strangelove Or, How I Learned to Stop Worrying and Love the Bomb*. General Jack D. Ripper, paranoid and sexually impotent, insists that he avoids sexual intercourse with women only because it results in a “loss of essence.” Ripper becomes obsessed with what he sees as a Soviet plot to pollute his “purity of essence” through fluoridation of water. He decides to wipe out the Soviet Union and orders airborne bombers to launch a nuclear attack, a move ultimately resulting in global apocalypse. General Ripper’s namesake, Jack the Ripper, did not rape his victims, but slit their throats and tore apart their breasts and genitals, actions that soon were understood as sexually motivated. Similarly, General Ripper avoids sexual intercourse, but substitutes a sexualized weapon-in his case, a nuclear bomb. The mutilated female corpse is the planet Earth. In 1948, when the United States was testing atomic weaponry on Bikini Atoll in the Pacific Ocean, the skimpy two-piece swimsuit was all the rage on the French Riviera. Popular jargon immediately joined the two phenomena. A long global history links the earth with the female body (Eliade, 1958a; Merchant, 1980). Such imagery is infused into cultural ideas about the Pacific Islands, which have long signified an erotic paradise to North Americans and Europeans, the original good place, the mother’s body (Porter, 1991, 104-5).

#### Nuclear power is the symbol of masculinity – a political artifact that rapes the earth and creates a monopolization of control over the notion of femininity. Maintaining production of the atom bomb replicates the hierarchal chain of command and oppressive power structures that follow from nuclear power

Grint and Gill 95 The Gender-technology Relation: Contemporary Theory and Research By Keith Grint, Rosalind Gill

nuclear technology is a useful example to illustrate some fundamental differences in approach to technology. Whereas a traditional approach might concede that the design and deployment of nuclear weapons has ‘political dimensions’, it would probably balk at assumptions that nuclear technology per se was inherently masculine and thus, for (some) women at least in need of replacement. Yet eco-feminism could point both to the immense power derived from nuclear sources and the prerequisite control over, and exploitation of nature, that this is implied. hence, what could be regarded as an inherently aggressive technology could not be harnessed for constructive purposes and must be interred and replaced by softer renewable green technologies such as wind and wave power. An alternative, but still essentialist, account nominates a particular form of political organization rather than masculinity, as the essential feature of nuclear power. thus winner argues that the atom bomb is an inherently political artifact. **as long as it exists, its lethal properties demand that it be controlled by a centralized, rigidly hierarchical chain of command.**

#### The production alone of weapons of mass destruction creates massive environmental destruction and violence that uniquely affects women.

Cohn and Ruddick ‘3 - \*founding director of the Consortium on Gender, Security and Human Rights and \*\* Winner of the Distinguished Woman Philosopher of the Year Award by the Society for Women in Philosophy and author of Maternal Thinking: Toward a Politics of Peace (Carol and Sara, “A Feminist Ethical Perspective on Weapons of Mass Destruction,” Working Paper No. 104 Consortium on Gender, Security, and Human Rights, 2003, http://genderandsecurity.org/sites/default/files/carol\_cohn\_and\_sara\_ruddick\_working\_paper\_104.pdf) \*/KE \*we don’t endorse the ablest language in this evidence\*

Question Three asks whether it is ethical to develop and deploy WMD as deterrents only. That is, it asks the classic question of whether it is ethical to have weapons and threaten to use then, even if it is not ethical to use those weapons militarily. As the question is framed, then, “development” and “deployment” appear not as phenomena subject to ethical scrutiny unto themselves, but merely as way-stations, as adjuncts subsumed under what is taken to be the core ethical issue, which is seen as deterrence. 14 Carol Cohn and Sarah Ruddick Working Paper No. 104 This formulation does not work for us. We need to pause and recognize that there are really several questions enfolded in that one. We must not only ask about the ethical status of deterrence, but also whether its entailments – development and deployment – are themselves ethical. 27 One of the constitutive positions of anti-war feminism is that in thinking about weapons and wars, we must accord full weight to their daily effects on the lives of women. We then find that the development and deployment of nuclear weapons, even when they are not used in warfare, exacts immense economic costs that particularly affect women. In the words of a recent Indian feminist essay: “The social costs of nuclear weaponisation in a country where the basic needs of shelter, food and water, electricity, health and education have not been met are obvious.... [S]ince patriarchal family norms place the task of looking after the daily needs of the family mainly upon women, scarcity of resources always hits women the hardest. Less food for the family inevitably means an even smaller share for women and female children just as water shortages mean an increase in women’s labour who have to spend more time and energy in fetching water from distant places at odd hours of the day.” 28 While the US is not as poor a nation as India, Pakistan, or Russia, it has remained, throughout the nuclear age, a country in which poverty and hunger are rife, health care still unaffordable to many, low-cost housing unavailable, with crumbling public schools and infrastructure, all while the American nuclear weapons program has come at the cost of 4.5 trillion dollars.29 In addition to being economically costly, nuclear weapons development has medical and political costs. In the US program, many people have been exposed to high levels of radiation, including uranium miners; workers at reactors and processing facilities; the quarter of a million military personnel who took place in “atomic battlefield” exercises; “downwinders” from test sites; and Marshallese Islanders. 30 Politically, nuclear regimes require a level of secrecy and security measures that exclude the majority of citizens, and in most countries, all women, from defense policy and decision- making.” 31 From the perspective of women’s lives, we see not only the costs of the development of nuclear weapons, but also the spiritual, social and psychological costs of deployment. One cost, according to some feminists, is that “Nuclearisation produces social consent for increasing levels of violence. 32 Another cost, for many, is that nuclear weapons create high levels of tension, insecurity and fear. As Arundhati Roy puts it, nuclear weapons “[i]nform our dreams. They bury themselves like meat hooks deep in the base of our brains.” 33 Further, feminists are concerned about the effect of nuclear policy on moral thought, on ideas about gender, and how the two intersect. Nuclear development may legitimize male aggression, 15 Carol Cohn and Sarah Ruddick Working Paper No. 104 and breed the idea that nuclear explosions give a ‘virility’ to the nation which men as individuals can somehow also share. [T]he strange character of nuclear policy- making not only sidelines moral and ethical questions, but genders them. This elite gets to be represented as rational, scientific, modern, and of course masculine, while ethical questions, questions about the social and environmental costs are made to seem emotional, effeminate, regressive and not modern. This rather dangerous way of thinking, which suggests that questions about human life and welfare are somehow neither modern nor properly masculine questions, or that men have no capacity and concern for peace and morality, can have disastrous consequences for both men and women. 34 All in all, we find the daily costs of WMD development and deployment staggeringly high – in and of themselves sufficient to prevent deterrence from being an ethical moral option. A so-called “realist” response to this jud gement might well pay lip-service to the “moral niceties” it embodies, but then argue that deterrence is worth those costs. Or, perhaps to be more accurate, it might argue that the results of a nuclear attack would be so catastrophic that the rest of these considerations are really an irrelevant distraction; deterring a WMD attack on our homeland is the precondition on which political freedom and social life depend, and so it must be thought about in a class by itself. We make two rejoinders to this claim. First, we note that in the culture of nuclear defense intellectuals, even raising the issue of costs is delegitimized, in large part through its association with “the feminine.” It is the kind of thing that “hysterical housewives” do; something done by people not tough and hard enough to look harsh “reality” in the eye, unsentimentally; not strong enough to separate their feelings from theorizing mass death; people who don’t have “the stones for war.” Feminist analysis rejects the cultural division of meaning which devalues anything associated with women or femininity. It sees in that same cultural valuing of the so-called “masculine” over the so-called “feminine” an explanation of why it appears so self-evident to many that what is called “military necessity” should appropriately be prioritized over all other human necessities. And it questions the assumptions that bestow the mantle of “realism” on such a constrained focus on weapons and state power. Rather than simply being an “objective” reflection of political reality, we understand this thought system as 1) a partial and distorted picture of reality, and 2) a major contributor to creating the very circumstances it purports to describe and protect against. Second, just as feminists tend to be skeptical about the efficacy of violence, they might be equally skeptical about the efficacy of deterrence. Or, to put it another way, if war is a “lie,” so is deterrence. This is not, of course, to say that deterrence as a phenomena never occurs; no doubt one opponent is sometimes deterred from attacking another by the fear of retaliation. But rather deterrence as a theory, a discourse and set of practices underwritten by that discourse, is a fiction. 16 Carol Cohn and Sarah Ruddick Working Paper No. 104 Deterrence theory is an elaborate, abstract conceptual edifice, which posits a hypothetical relation between two different sets of weapons systems – or rather, between abstractions of two different sets of weapons systems, for in fact, as both common sense and military expertise tells us, human error and technological imperfection mean that one could not actually expect real weapons to function in the ways simply assumed in deterrence theory. Because deterrence theory sets in play the hypothetical representations of various weapons systems, rather than assessments of how they would actually perform or fail to perform in warfare, it can be nearly infinitely elaborated, in a never ending regression of intercontinental ballistic missile gaps and theater warfare gaps and tactical “mini- nuke” gaps, ad infinitum, thus legitimating both massive vertical proliferation and arms racing. Deterrence theory is also a fiction in that it depends upon “rational actors,” for whom what counts as “rational” is the same, independent of culture, history, or individual difference. It depends on those “rational actors” perfectly understanding the meaning of “signals” communicated by military actions, despite dependence on technologies that sometimes malfunction; despite cultural difference and the lack of communication that is part of being political enemies; despite the difficulties of ensuring mutual understanding even when best friends make direct face-to- face statements to each other. It depends on those same “rational actors” engaging in a very specific kind of calculus that includes one set of variables (e.g., weapons size, deliverability, survivability, as well as the “credibility” of their and their opponent’s threats), and excludes other variables (such as domestic political pressures, economics, or individual subjectivity). What is striking from a feminist perspective is that even while “realists” may worry that some opponents are so “insufficiently rational” as to be undeterrable, this does not lead them to search for a more reliable form of ensuring security, or an approach that is not so weapons-dependent. Cynthia Cockburn, in her study of women’s peace projects in conflict zones, describes one of the women’s activities as helping each other give up “dangerous day dreams.” 35 From a feminist anti-war perspective, having WMD as deterrents is a dangerous dream. The dream of perfect rationality and control which underwrites deterrence theory is a dangerous dream, since it legitimates constructing a system that only could be (relatively) safe if that perfect rationa lity and control were actually possible. Deterrence theory itself is a dangerous dream because it justifies producing and deploying WMD, thereby making their accidental or purposive use possible (and far more likely) than if they were not produced at all, nor deployed in such numbers. “Realists” are quick to point out the dangers of not having WMD for deterrence when other states have them. Feminist perspectives suggest that that danger only appears so self-evidently greater than the danger of having WMD if you discount as “soft” serious attention to the costs of development and deployment. 17 Carol Cohn and Sarah Ruddick Working Paper No. 104

## Underview

#### Nuclear power has already peaked and is not ready to produce all of world’s energy. Renewables are ready.

Diesendorf 16

Diesendorf, Mark. "Renewable Energy versus Nuclear: Dispelling the Myths." *Energy Post*. N.p., 31 May 2016. Web. 09 Sept. 2016. <http://www.energypost.eu/renewable-energy-versus-nuclear-dispelling-myths/> CP MLT

Nuclear energy and renewable energy are the principal competitors for low-carbon electricity in many countries. As renewable energy technologies have grown in volume and investment, and become much cheaper, nuclear proponents and deniers of climate science have become deniers of renewable energy. The strategies and tactics of renewable energy deniers are very similar to those of climate science deniers. To create uncertainty about the ability of renewable energy to power an industrial society, they bombard decision-makers and the media with negative myths about renewable energy and positive myths about nuclear energy, attempting to turn these myths into conventional wisdom. In responding to the climate crisis, few countries have the economic resources to expand investment substantially in both nuclear and renewable energy. This is demonstrated in 2016 by the UK government, which is offering huge long-term subsidies to nuclear while severely cutting existing short-term subsidies to renewable energy. This article, a sequel to one [busting the myth that we need base-load power stations such as nuclear or coal](http://reneweconomy.com.au/2016/dispelling-the-nuclear-baseload-myth-nothing-renewables-cant-do-better-94486), examines critically some of the other myths about nuclear energy and renewable energy. It offers a resource for those who wish to question these myths. The myths discussed here have been drawn from comments by nuclear proponents and renewable energy opponents in the media, articles, blogs and on-line comments. Myth 1: Base-load power stations are necessary to supply base-load demand. Variant: Base-load power stations must be operated continuously to back-up variable renewable energy systems. Variant: Renewable energy is too variable to reliably make the principal contribution to large-scale electricity supply. This myth is refuted in [my previous article](http://reneweconomy.com.au/2016/dispelling-the-nuclear-baseload-myth-nothing-renewables-cant-do-better-94486). Myth 2: There is a renaissance in nuclear energy. Global nuclear electricity production in terawatt-hours per year (TWh/y) peaked in 2006. The percentage contribution of nuclear energy to global electricity peaked at 17.5% in 1993 and declined to under 11% in 2014. Nowadays annual global investment in nuclear is exceeded by investment in each of wind and solar. Over the past decade the number of global start-ups of new nuclear power reactors has been approximately balanced by the number of closures of existing reactors. While several European countries are phasing out nuclear energy, most growth in nuclear reactor construction is occurring in China, Russia, India and South Korea. ([World Nuclear Industry Status Report 2015](http://www.worldnuclearreport.org/)) Myth 3: Renewable energy is not ready to replace fossil fuels, and nuclear energy could fill the (alleged) gap in low-carbon energy supply. Most existing nuclear power reactors are classified as Generation 2 and are widely regarded as obsolete. The current generations of new nuclear power stations are classified as Generation 3 and 3+. Only four Generation 3 reactors have operated, so far only in Japan, and their performance has been poor. No Generation 3+ reactor is operating, although two are under construction in Europe, four in the USA and several in China. All are behind schedule and over-budget – the incomplete European reactors are already triple their b udgeted prices. Not one Generation 4 power reactor – e.g. fast breeder, integral fast reactor (IFR), small modular reactor – is commercially available. ([World Nuclear Industry Status Report](http://www.worldnuclearreport.org/) 2015) So it can be argued that modern nuclear energy is not ready. On the other hand, wind and solar are both growing rapidly and are still becoming cheaper. Large wind and solar farms can be planned and built in 2-3 years (compared with 10-15 years for nuclear) and are ready now to replace fossil and nuclear electricity. Myth 4: Nuclear weapons proliferation is independent of civil nuclear energy. Variant: Nuclear weapons explosives cannot be made from the type of plutonium produced in conventional nuclear power reactors, or from the thorium fuel cycle, or from the IFR. Six countries (France, India, North Korea, Pakistan, South Africa and the UK) have covertly used civil nuclear energy to assist them to develop nuclear weapons. In addition, at least seven countries (Argentina, Australia, Brazil, Iran, Libya, South Korea and Taiwan) have used civil nuclear energy to commence covertly developing nuclear weapons, but then terminated their programs (references in Diesendorf 2014). Thus nuclear energy is facilitating proliferation and therefore is increasing the probability of nuclear war. Even if the probability of nuclear war is small (and this is debatable), [the potential impacts are huge](http://www.scientificamerican.com/article/local-nuclear-war/). Therefore it is inappropriate to ignore the proliferation risk, which is probability multiplied by potential impact. Thorium reactors are under development in India. Thorium is not fissile, so it first has to be bombarded with neutrons to convert it into uranium-233, which is. Like any fissile element, U-233 can be used either to [generate heat and hence electricity, or as a nuclear explosive](http://www.nature.com/nature/journal/v492/n7427/full/492031a.html). Nuclear weapons with U-233 as part of the explosive have been tested by the USA ([Teapot MET test](http://nuclearweaponarchive.org/Usa/Tests/Teapot.html)), Soviet Union and India. Some nuclear proponents claim incorrectly that the hypothetical IFR would be proliferation-proof. The IFR has only ever operated as a single prototype in the USA. The project was cancelled by Congress in 1994 for reasons including funding, doubts about whether it was needed, and concerns about its potential for proliferation (Kerry 1994). The IFR offers at least two proliferation pathways. Once it has separated most of the highly radioactive fission products from the less radioactive transuranics by means of an experimental process known as pyroprocessing, it would be easier to extract the plutonium-239 from the transuranics by means of conventional chemical reprocessing and use it to produce nuclear weapons. An alternative proliferation pathway would be to modify an IFR to enable it to be used as a breeder reactor to [produce weapons grade plutonium from uranium-238](http://www.princeton.edu/~ota/disk1/1994/9434/9434.PDF) – see also Wymer et al. (1992). Myth 5: The death toll from the Chernobyl disaster was 28-64. These absurdly low estimates are obtained by considering only short-term deaths from acute radiation syndrome and ignoring the major contribution to fatalities, namely cancers that appear over several decades. For Chernobyl, the lowest serious estimate of future cancer deaths was ‘up to 4000’ by the Chernobyl Forum (2006), a group of United Nations agencies led by the International Atomic Energy Agency (IAEA), which has the conflicting goals of promoting nuclear energy and applying safeguards against inter alia accidents and proliferation. Estimates from authors with no obvious conflict of interest range from 16,000 from the [International Agency for Research on Cancer](https://www.researchgate.net/publication/7151231_Estimates_of_the_cancer_burden_in_Europe_from_radioactive_fallout_from_the_Chernobyl_accident) to 93,000 from a team of[international medical researchers from Ukraine, Russia and elsewhere](http://www.greenpeace.org/international/Global/international/planet-2/report/2006/4/chernobylhealthreport.pdf). Myth 6: The problem of permanently storing high-level nuclear wastes has been solved. All high-level waste is currently in temporary storage in pools or dry casks. Not one permanent repository is operating in the world. Development of the proposed US repository at Yucca Mountain in the USA was terminated after expenditure of $13.5 billion. Underground repositories are under construction in Sweden and Finland. Even if the technical and economic challenges could be solved, the social problem of managing or isolating the repositories for 100,000 years remains. Myth 7: The IFR could ‘burn up’ the world’s nuclear wastes. The IFR only exists as a design. If it were ever developed, it would become another proliferation pathway (see Myth 4). At best it could convert most transuranics to fission products, so underground long-term repositories would still be needed for the highly radioactive fission products. For a fuller exposition of the problems of IFRs and other ‘new’ reactor designs, see Amory Lovins’s classic 2009 essay, recently republished on The Ecologist: ‘ [“New” nuclear reactors? same old story](http://www.theecologist.org/essays/2987536/new_nuclear_reactors_same_old_story.html)‘. Myth 8: Nuclear energy emits no or negligible greenhouse gas emissions. Neither nuclear energy nor most renewable technologies emit CO2 during operation. However, meaningful comparisons must compare whole life-cycles from mining the raw materials to managing the wastes. Nuclear physicist and nuclear supporter Manfred Lenzen [found](http://www.energiasostenible.org/mm/file/GCT2008%20Doc_ML-LCE%26Emissions.pdf) average life-cycle emissions for nuclear energy, based on mining high-grade uranium ore, of 60 grams of CO2 per kilowatt-hour (g/kWh), for wind of 10–20 g/kWh and for natural gas 500–600 g/kWh. Now comes the part that most nuclear proponents try to ignore or misrepresent. The world has only a few decades of high-grade uranium ore reserves left. As the ore-grade inevitably declines, the fossil fuel used to mine (with diesel fuel) and mill uranium increases and so do the resulting greenhouse gas (GHG) emissions. Lenzen [calculates](http://www.energiasostenible.org/mm/file/GCT2008%20Doc_ML-LCE%26Emissions.pdf) that, when low-grade uranium ore is used, the life-cycle GHG emissions will increase to 131 g/kWh. Others have obtained higher levels. This is [unacceptable in terms of climate science](http://theconversation.com/sure-lets-debate-nuclear-power-just-dont-call-it-low-emission-21566). Only if mining low-grade ore were done with renewable fuel, or if fast breeder reactors replaced burner reactors, could nuclear GHG emissions be kept to an acceptable level, but neither of these conditions is likely to be met for decades at least. For more on this topic, see Keith Barnham’s article ‘[False solution: nuclear power is not low carbon](http://www.theecologist.org/News/news_analysis/2736691/false_solution_nuclear_power_is_not_low_carbon.html)’. Myth 9: Nuclear energy is a suitable partner for renewable energy in the grid. Making a virtue out of necessity, nuclear proponents claim that we can have both (new) nuclear and renewables in the same grid. However, nuclear energy is a poor partner for a large contribution of variable renewable energy in an electricity supply system for four reasons: (1) Nuclear power reactors are inflexible in operation (see response to Myth 10), compared with open cycle gas turbines (which can be biofuelled), hydro with dams and concentrated solar thermal (CST) with thermal storage. Wind and solar PV can supply bulk energy, balanced by flexible, dispatchable renewables, as discussed [previously](http://reneweconomy.com.au/2016/dispelling-the-nuclear-baseload-myth-nothing-renewables-cant-do-better-94486). (2) When a nuclear power station breaks down, it is usually off-line for weeks or months. For comparison, lulls in wind last typically for hours or days, so wind does not need expensive back-up from base-load power stations – flexible dispatchable renewable energy suffices. (3) Wind and solar farms are cheaper to operate than nuclear (and fossil fuels). Therefore wind and solar can bid lower prices into electricity markets and displace nuclear from base-load operation, which it needs to pay off its huge capital costs. (4) Renewables and nuclear compete for support policies from government including scarce finance and subsidies. For example, the UK government commitment to Hinkley C, with enormous subsidies, has resulted in [removal of subsidies to on-shore wind and solar PV](http://www.theecologist.org/News/news_analysis/2960124/tories_attack_on_green_energy_threatens_climate_and_prosperity.html). Myth 10: Nuclear power reactors can generally be operated flexibly to follow changes in demand/load. The limitations, both technical and economic, are demonstrated by France, with 77% of its electricity generated from nuclear. Since the current generation of nuclear power stations is not designed for load-following, France can only operate some of its reactors in load-following mode some of the time – at the beginning of their operating cycle, with fresh fuel and high reserve reactivity – but cannot continue to load-follow in the late part of their cycle. This is acknowledged by the [World Nuclear Organisation](http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/france.aspx). Load-following has two economic penalties for base-load power stations: Substantially increased maintenance costs due to loss of efficiency. Reduced earnings during off-peak periods. Yet, to pay off of their high capital cost, the reactors must be operated as much as possible at rated power. France reduces the second economic penalty by selling its excess nuclear energy to neighbouring countries via transmission line, while parts of Australia soak up their excess base-load coal energy with cheap off-peak water heating. Myth 11: Renewable energies are more expensive than nuclear. Variant: Nuclear energy receives smaller subsidies than renewable energy. Both versions of the myth are false. Levelised costs of energy (LCOE) depend on the number of units installed at a site, location, capital cost, interest rate and capacity factor (actual average power output divided by rated power). LCOE estimates for nuclear are $108/MWh based on [pre-2014 data from the IPCC](http://www.ipcc.ch/report/ar5/wg3/) and $97-132/MWh based on [pre-2015 data from multinational financial consultants Lazard](https://www.lazard.com/perspective/levelized-cost-of-energy-analysis-90/). The IPCC cost estimate does not include subsidies, while the Lazard estimate includes US federal government subsidies excluding loan guarantees and decommissioning. None of these US estimates takes account of the huge escalation in costs of the two European Pressured Water Reactors (EPR) under construction (mentioned in Myth 3). The EPR proposed for the UK, Hinkley C, is being offered a guaranteed inflation-linked price for electricity over 35 years, commencing at £92.5/MWh (US$144/MWh) (2012 currency), more than double the wholesale price of electricity in the UK, together with a loan guarantee of originally £10 billion (US$15.3 billion). [Its capped liability for accidents and inadequate insurance](http://www.theecologist.org/blogs_and_comments/commentators/2265605/the_true_cost_of_disaster_insurance_makes_nuclear_power_uncompetitive.html) is likely to fall upon the British taxpayer. In 2015 [Lazard estimated](https://www.lazard.com/perspective/levelized-cost-of-energy-analysis-90/) unsubsidised costs for on-shore wind across the USA of US$32–77/MWh. An independent empirical study by [US Department of Energy](http://energy.gov/sites/prod/files/2015/08/f25/2014-Wind-Technologies-Market-Report-8.7.pdf) (Fig. 46) found levelised power purchase agreement prices in 2014 for wind in the US interior (region with the highest wind speeds) of US$22/MWh, and in the west (region with lowest wind speeds) about US$60/MW. The US government subsidises wind with a Production Tax Credit of US$23/MWh over 10 years, so this must be added to the DoE figures to obtain the actual costs. [In Brazil](http://www.gwec.net/wp-content/uploads/2015/03/GWEC_Global_Wind_2014_Report_LR.pdf) in 2014, contracts were awarded at a reverse auction for an average unsubsidised clearing price of 129.3 real/MWh (US$41/MWh). Lazard estimated unsubsidised costs of US$50–70/MWh for large-scale solar PV in a high insolation region of the USA. In New Mexico, USA, a Power Purchase Agreement for US$57.9/MWh has been signed for electricity from the Macho Springs 50 MW solar PV power station; federal and state subsidies bring the actual cost to around US$80–90/MWh depending on location. In Chile, Brazil and Uruguay,unsubsidised prices at reverse auctions are in the same range (Diesendorf 2016). Rooftop solar ‘behind the meter’ is competitive with retail grid electricity prices in many regions of the world with medium to high insolation, even where there are no feed-in tariffs. For CST with thermal storage, Lazard estimates US$119-181/MWh. Comparing subsidies between nuclear and renewable energy is difficult, because they vary substantially in quantity and type from country to country, where nuclear subsidies may include some or all of the following (Diesendorf 2014): government funding for research and development, uranium enrichment, decommissioning and waste management; loan guarantees; stranded assets paid for by taxpayers and electricity ratepayers; limited liabilities for accidents covered by victims and taxpayers; generous contracts for difference. Subsidies to nuclear have either remained constant or increased over the past 50 years, while subsidies to renewable energy, especially feed-in tariffs, have decreased substantially (to zero in some places) over the past decade. Myth 12: Renewable energy is very diffuse and hence requires huge land areas. Hydro-electric dams and dedicated bioenergy crops can occupy large areas, but renewable energy scenarios for few regions have large additional contributions from these sources. Solar farms located on-ground may occupy significant land, often marginal land. Rooftop solar, which is widespread in Germany and Australia, and bioenergy derived from crop residues occupy no additional land. On-shore wind farms are generally located on agricultural land, with which they are highly compatible. The land occupied is[typically 1-2% of the land spanned](ftp://ftp.manomet.org/WildlifeandEnergy/Literature_8July10/NREL_Land_Use_2009.pdf). renewable energy deniers often ignore this and misleadingly quote the land area spanned. For an economic optimal mix of 100% renewable electricity technologies calculated for the Australian National Energy Market, total land area in km2/TWh/y is about half that of equivalent nuclear with a hypothetical buffer zone of radius 20 km, as belatedly established for Fukushima Daiichi (Diesendorf 2016). Myth 13: Energy payback periods (in energy units, not money) of renewable energy technologies are comparable with their lifetimes. Nowadays typical energy payback periods in years are: solar PV modules 0.5-1.8; large wind turbines 0.25-0.75; CST (parabolic trough) 2; nuclear (high-grade-uranium ore) 6.5; nuclear (low-grade-uranium ore) 14 (references in Diesendorf 2014, Table 5.2). The range of values reflects the fact that energy payback periods, and the related concept of energy return on energy invested, depend on the type of technology and its site. Critics of renewable energy often quote much higher energy payback periods for renewable energy technologies by [assuming incorrectly that each has to be backed-up continuously by a fossil fuelled power station](http://reneweconomy.com.au/2016/dispelling-the-nuclear-baseload-myth-nothing-renewables-cant-do-better-94486). Myth 14: Danish electricity prices are among the highest in Europe, because of the large contribution from wind energy. Danish retail electricity prices are among the highest in Europe, because electricity is taxed very heavily. This tax goes into consolidated revenue – it does not subsidise wind energy. [Comparing tax-free electricity prices](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Electricity_prices_for_household_consumers,_second_half_2014_(%C2%B9)_(EUR_per_kWh)_YB15.png) places Denmark around the European average. Wind energy in Denmark is subsidised by feed-in tariffs funded by a very small increase in retail electricity prices, which [is offset by the decrease in wholesale electricity prices](http://www.energyplanning.aau.dk/) resulting from the large wind energy contribution. Myth 15: Computer simulation models of the operation of electricity grids with 80-100% renewable electricity are meaningless over-simplifications of real systems. Although a model is indeed a simplified version of reality, it can be a powerful low-cost tool for exploring different scenarios. Most modellers start with simple models, in order to understand some of the basic relationships between variables. Then, step-by-step, as understanding grows, they make the models more realistic. For example, [initially](http://www.ceem.unsw.edu.au/sites/default/files/documents/simulations.pdf) the UNSW Australia group simulated the operation of the Australian National Electricity Market with 100% renewable energy in hourly time-steps spanning a single year. Wind farms were simply scaled up at existing sites. The [next model](http://ceem.unsw.edu.au/sites/default/files/documents/LeastCostElectricityScenariosInPress2013.pdf) included economic data and calculated the economic optimal mix of renewable energy technologies and then [compared costs with low-carbon fossil fuelled scenarios](http://ceem.unsw.edu.au/sites/default/files/documents/Low%20Emission%20Fossil%20Scenarios.pdf). [Recently the simulations were extended](http://ceem.unsw.edu.au/sites/default/files/documents/WhatCostMoreRenewables-preprint_0.pdf) to six years of hourly data, the renewable energy supply region was decomposed into 43 sub-regions and a limit was imposed on non-synchronous supply. With all these refinements in the model, the 100% renewable energy system is still found to be reliable and affordable. Meanwhile, [researchers at Stanford University have shown](http://web.stanford.edu/group/efmh/jacobson/Articles/I/CombiningRenew/CONUSGridIntegration.pdf) that all energy use in the USA, including transport and heat, could be supplied by renewable electricity. Their computer simulations use synthetic data on electricity demand, wind and sunshine taken every 30 seconds over a period of six years. Using synthetic data allows modellers to include big hypothetical fluctuations in the weather. Such sensitivity analysis strengthens the power and credibility of the models. Strangely, some of the loudest critics of simulation modeling of electricity systems, a specialised field, have no qualifications in physical science, computer science, engineering or applied mathematics. In Australia they include two biologists, a social work academic and an occupational therapist. Conclusion Computer simulation models and growing practical experience suggest that electricity supply in many regions, and possibly the whole world, could transition to 100% renewable energy. Most of the renewable energy technologies are commercially available, affordable and environmentally sound. There is no fundamental technical or economic reason for delaying the transition. The pro-nuclear and anti-renewable energy myths disseminated by nuclear proponents and supporters of other vested interests do not stand up to examination. Given the political will, renewable energy could be scaled up long before Generation 3 and 4 nuclear power stations could make a significant contribution to electricity supply.

#### No matter the type, the nuclear energy market is ran by lobbyist and PR firms making government secrecy a fervent issue. Autocracy will prop up the market reintrenching a form of hierarchy and oppression.

Wasserman 16 (Harvey, <http://www.counterpunch.org/2016/07/29/ny-times-pushes-nukes-while-claiming-renewables-fail-to-fight-climate-change/> , 7-29)

The idea that nuclear power might fight climate change, and that environmentalists might support it, is a recent concoction, a disgraceful, desperate load of utility hype meant to defend the status quo. Fukushima, unsolved waste problems and the plummeting price of renewables have solidified the environmental community’s opposition to nuke power. These reactors are dirty and dangerous. They are not carbon-free and do emit huge quantities of heated water and steam into the ecosphere. The utility industry can’t get private liability insurance for them, and relies on the1957 Price-Anderson Act to protect them from liability in a major catastrophe. The industry continually complains about subsidies to renewable energy but never mentions this government protection program without which all reactors would close. 7. Not just nuke power but the entire centralized fossil/nuke-based grid system is now being undermined by the massive drops in the price of renewable energy, and massive rises in its efficiency and reliability. The critical missing link is battery technology. Because the sun and wind are intermittent, there needs to be energy storage to smooth out supply. Elon Musk‘s billion-dollar Tesla Gigafactory in Nevada and many other industrial ventures indicate major battery breakthroughs in storage is here today. 8. Porter’s NY Times piece correctly says that the massive amounts of cheap, clean renewables flooding the grid in Europe and parts of the U.S. are driving nuclear power plants into bankruptcy. At least a dozen reactor shut downs have been announced in the U.S. since 2012 and many more are on their way. In Japan 52 of the 54 reactors online before the Fukushima disaster are now closed. And, Germany has pledged to shut all its reactors by 2022. But Porter attacks this by complaining that those nukes were supplying base load power that must be otherwise—according to him—shored up with fossil burners. Here’s his key line: “Renewable sources are producing temporary power gluts from Australia to California, driving out other energy sources that are still necessary to maintain a stable supply of power.” But as all serious environmentalists understand, the choice has never been between nukes versus fossil fuels. It’s between centralized fossil/nukes versus decentralized renewables. Porter’s article never mentions the word “battery” or the term “rooftop solar.” But these are the two key parts in the green transition already very much in progress. So here is what the Times obviously can’t bring itself to say: “Cheap solar panels on rooftops are now making the grid obsolete.” The key bridging element of battery back-up capability is on its way. Meanwhile there is absolutely no need for nuclear power plants, which at any rate have long since become far too expensive to operate. Spending billions to prop up dying nuke reactors for “base load” generation is pure corporate theft at the public expense, both in straight financial terms and in the risk of running badly deteriorated reactors deep into the future until they inevitably melt down or blow up. Those billions instead should go to accelerating battery production and distribution, and making it easier, rather than harder, to gain energy independence using the wind and the sun. All this has serious real-world impacts. In Ohio, for example, a well-organized shift to wind and solar was derailed by the Koch-run legislature. Some $2 billion in wind-power investments and a $500 million solar farm were derailed. There are also serious legal barriers now in place to stop homeowners from putting solar shingles and panels on their rooftops. Meanwhile, FirstEnergy strong-armed the Ohio Public Utilities Commission into approving a huge bailout to keep the seriously deteriorated Davis-Besse nuke operating, even though it cannot compete and is losing huge sums of money. Federal regulators have since put that bailout on hold. Arizona and other Koch-owned legislatures have moved to tax solar panels, ban solar shingles and make it illegal to leave the grid without still paying tribute to the utilities who own it. Indeed, throughout the U.S. and much of the western world, corporate-owned governments are doing their best to slow the ability of people to use renewables to rid themselves of the corporate grid. For an environmental movement serious about saving the Earth from climate change, this is a temporary barrier. The Times and its pro-nuke allies in the corporate media will continue to twist reality. But the Solartopian revolution is proceeding ahead of schedule and under budget. A renewable, decentralized energy system is very much in sight. The only question is how long corporate nonsense like this latest NY Times screed can delay this vital transition. Our planet is burning up from fossil fuels and being irradiated by decrepit money-losing reactors that blow up. Blaming renewable energy for all that is like blaming the peace movement for causing wars. The centralized King CONG grid and its obsolete owners are at the core of the problem. So are the corporate media outlets like the New York Times that try to hide that obvious reality.

#### Banning nuclear power causes a shift towards cleaner, safer, renewable energy- the empirical evidence is on my side. Agnihotri writes in 2016

Gaurav Agnihotri, a Mechanical engineer and an MBA -Marketing from ICFAI (Institute of Chartered Financial Accountants), Jul 30, 2016, 12:43 PM CDT “Is France Ready To Move Away Nuclear Energy?” [http://oilprice.com/Alternative-Energy/Nuclear-Power/Is-Francehttp://oilprice.com/Alternative-Energy/Nuclear-Power/Is-France-Ready-To-Move-Away-From-Nuclear-Energy.htmlReady-To-Move-Away-From-Nuclear-Energy.html](http://oilprice.com/Alternative-Energy/Nuclear-Power/Is-France-Ready-To-Move-Away-From-Nuclear-Energy.html)  [Premier]

France is the world’s most nuclear dependent country. With 58 nuclear reactors in 19 power stations having a total capacity of 63.2 gigawatts, France is the second largest producer of nuclear energy in the world, second only to the United States. But unlike the U.S., nuclear energy represents France’s largest source of electricity generation, accounting for around 77 percent of the country’s energy generation in 2014.

However, in the last few years, **France has witnessed growing public support in favor of developing newer technologies that can reduce carbon emissions and replace nuclear power**. In the year 2012, France’s newly elected President Francois Hollande **pledge**d **to reduce** his country’s **dependence on nuclear power** to 50 percent by 2025. This **triggered a ‘national debate for energy transition’ in France which lasted for eight months.** **The National Assembly of France then passed an Energy Transition for Green Growth bill in 2014 which would put a cap on the country’s nuclear power** capacity at the current level of 63.2 gigawatts. Related: Top 6 Most Powerful Women In Oil And Gas How will France meet this tough new target? Last week saw French Lawmakers finally pass this bill which seeks to cut the country’s growing dependence on nuclear power. With the move, France is following Germany, which decided to significantly reduce its dependence on nuclear energy after the infamous 2011- Fukushima nuclear disaster in Japan. In order to meet this tough new target, Electricite De France or EDF (which is 85 percent government-owned) would have no other option but to close some of its nuclear power capacity in order to accommodate its new European Pressurized Reactor (EPR), which is currently under construction in Normandy. **The new law further requires France to increase the contribution of renewables in its total energy consumption to 32 percent by 2030**. This is in addition to reducing the C02 emissions by 40 percent by 2030 when compared to 1990 levels and also reduce conventional fossil fuel consumption by 30 percent by 2030 from 2012 levels. Although the law has made it quite clear that France now has to reduce its dependence on nuclear power, there are still several loopholes, as it hasn’t provided a clear manner in which the set target is supposed to be met and there is no specific implementation strategy put in place yet. “This law sets goals, which is interesting, but it doesn't explain how to reach them, postponement of the detailed implementation plans is not a good sign," said Yannick Rousselet of Greenpeace. Can we expect massive investments in renewables and natural gas? “I want France to become a nation of environmental excellence,” said French environmental minister Segolene Royal. She further said that **recent steps** taken by the French government **could create close to 100,000 jobs in the renewable sector**. **As the new law has also set a goal of increasing overall renewable energy consumption while also curtailing nuclear power, we can expect some major foreign investments in the French clean energy sector in the coming few years. French energy giant Total has in fact been investing a substantial amount in the solar sector. With its partnership with U.S. based Sunpower, Total might just ramp up its investments in the French solar sector**. It is interesting to note that **wind energy also enjoys local public support** in France as a 2014-CSA survey revealed that around 64 percent of local people see wind energy **as a worthy replacement for nuclear power.** According to the European Wind Energy Association, France increased its target for energy generation from wind to 19 gigawatts by 2020 from 8.2 gigawatts in 2014. France is also the second largest producer of biofuels in Europe after Germany, mostly producing biodiesel. France has already set a goal of blending 10 percent of biofuels with its conventional fuels by 2020. So, with the current push towards renewables one can reasonably expect a surge in biofuel investments as well. However, the same cannot be said for natural gas, as France is one of the four countries that have banned hydraulic fracturing or fracking. **Experts predict that the French natural gas demand might even fall by the year 2020**. What does this mean for the suppliers of nuclear fuel and companies like AREVA? France‘s decision to reduce dependence on nuclear power will not go down well with the already struggling nuclear industry, which includes French players like Areva, EDF and GDF Suez. Areva, the world’s largest nuclear company, reported a loss of $4.8 billion in 2014 after it started facing a dip in demand following the 2011 Fukushima disaster. Areva is one of the most prominent companies in France, so the French government has been trying hard to save the company through a proposed deal with EDF, which involves selling off its reactor and fuel treatment business. According to recent reports, the French government could end up shelling out $5.5 billion to rescue Areva, far more than anticipated. **With its desire to shift away from nuclear energy, France is slowly and steadily preparing itself to adapt newer technologies and eventually move towards renewables. However, this transition requires a clear road map with a clear plan on the systematic closure of its nuclear capacity.** Without these, it might take several years (beyond the target dates) for the Energy Transition law to get implemented.

# Frontlines

## A2 Coal DA

#### Fossil fuels are likely to phase out with nuclear power decommissioning – empirics prove

Milenusnic 16 Mileusnic, Dragona. "The Future of Coal Is Grim, after the Paris Agreement." Center for International Relations and Sustainable Development. N.p., 24 Aug. 2016. Web. 26 Aug. 2016. <http://www.cirsd.org/en/blog/the-future-of-coal-is-grim-after-the-paris-agreement> CP

Fossil fuels are of need to complement renewables in power supply, at least in the transition phase they are an important contributor in both base load and peak supply. More precisely, from a climate perspective, the assumed phase-out of nuclear power requires less carbon intensive fossil fuel pow- er, e.g. gas-fired combined heat and power production. In accordance with assessed climate mitigation scenarios (cf. Section 2.3) in the short- (2020) to mid-term (2030) there will be still electricity generated from fossil fuels. As Figure 4-18 shows, the fossil part will be based on coal, lignite and natural gas.28 Coal and lignite will however have to phase-out by mid-century to fulfil the decarbonisation target of the electricity sector. To accom- plish this necessity in Europe, a CO2 price should be established that ensures that less carbon inten- sive fossil fuels gain sufficient competitiveness against more carbon intensive sources such as coal or lignite. The competition between gas and coal-fired power plants is currently dominated by coal as can be seen in the statistics of Eurostat (2013e). The production of electricity by coal and lignite grew from the lowest level of production on record since 1990 from 823 TWh in 2009 to 852 TWh in 2011. The opposite is true for the electricity production by natural gas in the EU. The production decreased from its highest level on record since 1990 of 813 TWh in 2008 to 732 TWh in 2011. More- over, a solution for another key challenge of the electricity market that affects all forms of (con- ventional) power production needs to be provided: the price depression on the wholesale market due to the merit order effect (cf. Box 10) that goes hand in hand with the increased deployment of (variable) RES. This can be seen as positive effect from a consumer perspective (if the decrease in wholesale prices is well reflected in end-user prices) but, on the other hand, as several studies pointed out (Frias et al., 2013) additional capacity will be required to back-up RES. According to Frias et al. (2013) “[this] raises the issue of whether this capacity will come online if prices are de- pressed (and therefore the investment signal is reduced). Currently, the European electricity mar- ket is characterized by a situation of overcapacity, so this should not be an issue in the medium term, and will anyway depend on the strength of the incentive for new investments (be them in the generation or demand side).” As part of an appropriate solution to handle this, new pricing and bidding rules have to be developed. As Frias et al. (2013) concluded: “Possibly, complex instead of simple bids could be beneficial for systems with a high renewables penetration. Also, joint bids for energy production and balancing services could be useful. Non-discriminatory pricing could be used to internalize non-convex-cost related components of the actual value of electricity market prices.”

#### 1. Shift will be to renewables. The Paris talks killed coal; most recent evidence.

Mileusnic 8-24

Mileusnic, Dragona. "The Future of Coal Is Grim, after the Paris Agreement." Center for International Relations and Sustainable Development. N.p., 24 Aug. 2016. Web. 26 Aug. 2016. <http://www.cirsd.org/en/blog/the-future-of-coal-is-grim-after-the-paris-agreement> CP MLT

Over the past several years, the impacts of climate change have become more visible across the globe. Unprecedented floods hit Southeast Europe in 2014, while 2015 was yet another hottest year on record worldwide. Such events set the stage for the discussion on the new international climate regime, for the period after 2020. The UN Climate Summit held in Paris last December was in many ways historic; and so were the trends leading to it and the developments unfolding in the months thereafter. Several factors enabled Paris to become a success. The green energy industry is flourishing and renewable technologies have become readily available in many developed and developing countries. These trends have strengthened global efforts to divest from fossil fuels, in favour of a complete switch to renewable energy sources. Along with a growing recognition by most of the developing countries that action needs to be taken now to rescue their chances for further development, these were the factors necessary for the success of Paris. Because of this, and the fact that over 190 countries agreed to it, the Paris Agreement actually has a historic character. In Paris, countries agreed to hold the increase in global average temperature “to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C”, as well as to bring greenhouse gas emissions down to net zero during the second part of this century. Knowing that scientific studies have found that 88% of the world's coal reserves should remain under the ground, in order to stay even below 2 ° C warming, it is clear that the target of 1.5 ° C requires speedy and decisive action. This means that after Paris, there is no real long-term future for the global coal industry. **So what comes after Paris?** After Paris, everyone has to act in order to enable the proper implementation of the Agreement. The role of non-state actors will be particularly important in the years to come, as Paris calls for a total shift of financial flows away from coal, oil and gas consumption. More importantly, various stakeholders have started to act and are actually spearheading climate action in the EU. While the European Commission still deliberates its course of action, a group of businesses, cities, regions, investors, trade unions, civil society groups and other stakeholders has demonstrated its readiness to support the objectives of the Paris Agreement. Climate Action Network Europe, together with Prince of Wales' Corporate Leaders’ Group, the European Trade Union Confederation and other stakeholders has launched a Coalition for Higher Ambition, calling on the EU to start responding to Paris adequately. What we expect to see now is the development of a robust European policy framework, which will allow the EU to become a zero carbon economy. Its current climate and energy targets are too low to reach the goals of the Paris Agreement and need to be tightened. Europe needs to stimulate long-term investments in low carbon technologies, in particular energy efficiency and renewable energy, as well as in sustainable agriculture and the protection and restoration of our ecosystems. Europe should develop an innovative European market that will allow all European leaders, citizens and workers to benefit in terms of good quality jobs, sustainable growth, improved competitiveness and better public health, while ensuring a just transition for the workforce. Europe also needs to continue demonstrating international leadership by securing early ratification of Paris and working with other countries to support their delivery of the Paris Agreement. 2016 is a critical year for the implementation of the Paris Agreement as well as the Sustainable Development Goals through the development of EU legislation that will bring the EU’s 2030 climate and energy package to life. It must not be forgotten that 2016 is also the year of the delivery of the Energy Union, another initiative launched by this European Commission. Commission President Juncker has already flagged that Europe must become a global leader in renewable energy. We hope that 2016 helps us move a step closer towards this goal. This will not be an easy task knowing that China has achieved two world records last year: it built 32.5 gigawatts (GW) of wind power, and installed 18.3 GW of solar power, leaving the EU far behind. Chinese renewable energy production is growing fast, while coal consumption is going down.

#### Alt cause; deforestation

Scientific American 12

"Deforestation and Its Extreme Effect on Global Warming." *Scientific American*. N.p., 13 Nov. 2012. Web. 26 Aug. 2016.

<http://www.scientificamerican.com/article/deforestation-and-global-warming/> CP MLT

By most accounts, deforestation in tropical rainforests adds more carbon dioxide to the atmosphere than the sum total of cars and trucks on the world’s roads. According to the World Carfree Network (WCN), cars and trucks account for about 14 percent of global carbon emissions, while most analysts attribute upwards of 15 percent to deforestation. The reason that logging is so bad for the climate is that when trees are felled they release the carbon they are storing into the atmosphere, where it mingles with greenhouse gases from other sources and contributes to global warming accordingly. The upshot is that we should be doing as much to prevent deforestation as we are to increase fuel efficiency and reduce automobile usage. According to the Environmental Defense Fund (EDF), a leading green group, 32 million acres of tropical rainforest were cut down each year between 2000 and 2009—and the pace of deforestation is only increasing. “Unless we change the present system that rewards forest destruction, forest clearing will put another 200 billion tons of carbon into the atmosphere in coming decades…,” says EDF. “Any realistic plan to reduce global warming pollution sufficiently—and in time—to avoid dangerous consequences must rely in part on preserving tropical forests,” reports EDF. But it’s hard to convince the poor residents of the Amazon basin and other tropical regions of the world to stop cutting down trees when the forests are still worth more dead than alive. “Conservation costs money, while profits from timber, charcoal, pasture and cropland drive people to cut down forests,” adds EDF. Exacerbating global warming isn’t the only negative impact of tropical deforestation. It also wipes out biodiversity: More than half of the world’s plant and animal species live in tropical rainforests. One way some tropical countries are reducing deforestation is through participation in the United Nations’ Reducing Emissions from Deforestation and Forest Degradation (REDD) program. REDD essentially works to establish incentives for the people who care for the forest to manage it sustainably while still being able to benefit economically. Examples include using less land (and therefore cutting fewer trees) for activities such as coffee growing and meat and milk production. Participating nations can then accrue and sell carbon pollution credits when they can prove they have lowered deforestation below a baseline. The REDD program has channeled over $117 million in direct financial aid and educational support into national deforestation reduction efforts in 44 developing countries across Africa, Asia and Latin America since its 2008 inception. Brazil is among the countries embracing REDD among other efforts to reduce carbon emissions. Thanks to the program, Brazil has slowed deforestation within its borders by 40 percent since 2008 and is on track to achieve an 80 percent reduction by 2020. Environmentalists are optimistic that the initial success of REDD in Brazil bodes well for reducing deforestation in other parts of the tropics as well.

#### 3. Nuclear power has already peaked and is not ready to produce all of world’s energy. Renewables are ready.

Diesendorf 16

Diesendorf, Mark. "Renewable Energy versus Nuclear: Dispelling the Myths." *Energy Post*. N.p., 31 May 2016. Web. 09 Sept. 2016. <http://www.energypost.eu/renewable-energy-versus-nuclear-dispelling-myths/> CP MLT

Nuclear energy and renewable energy are the principal competitors for low-carbon electricity in many countries. As renewable energy technologies have grown in volume and investment, and become much cheaper, nuclear proponents and deniers of climate science have become deniers of renewable energy. The strategies and tactics of renewable energy deniers are very similar to those of climate science deniers. To create uncertainty about the ability of renewable energy to power an industrial society, they bombard decision-makers and the media with negative myths about renewable energy and positive myths about nuclear energy, attempting to turn these myths into conventional wisdom. In responding to the climate crisis, few countries have the economic resources to expand investment substantially in both nuclear and renewable energy. This is demonstrated in 2016 by the UK government, which is offering huge long-term subsidies to nuclear while severely cutting existing short-term subsidies to renewable energy. This article, a sequel to one [busting the myth that we need base-load power stations such as nuclear or coal](http://reneweconomy.com.au/2016/dispelling-the-nuclear-baseload-myth-nothing-renewables-cant-do-better-94486), examines critically some of the other myths about nuclear energy and renewable energy. It offers a resource for those who wish to question these myths. The myths discussed here have been drawn from comments by nuclear proponents and renewable energy opponents in the media, articles, blogs and on-line comments. Myth 1: Base-load power stations are necessary to supply base-load demand. Variant: Base-load power stations must be operated continuously to back-up variable renewable energy systems. Variant: Renewable energy is too variable to reliably make the principal contribution to large-scale electricity supply. This myth is refuted in [my previous article](http://reneweconomy.com.au/2016/dispelling-the-nuclear-baseload-myth-nothing-renewables-cant-do-better-94486). Myth 2: There is a renaissance in nuclear energy. Global nuclear electricity production in terawatt-hours per year (TWh/y) peaked in 2006. The percentage contribution of nuclear energy to global electricity peaked at 17.5% in 1993 and declined to under 11% in 2014. Nowadays annual global investment in nuclear is exceeded by investment in each of wind and solar. Over the past decade the number of global start-ups of new nuclear power reactors has been approximately balanced by the number of closures of existing reactors. While several European countries are phasing out nuclear energy, most growth in nuclear reactor construction is occurring in China, Russia, India and South Korea. ([World Nuclear Industry Status Report 2015](http://www.worldnuclearreport.org/)) Myth 3: Renewable energy is not ready to replace fossil fuels, and nuclear energy could fill the (alleged) gap in low-carbon energy supply. Most existing nuclear power reactors are classified as Generation 2 and are widely regarded as obsolete. The current generations of new nuclear power stations are classified as Generation 3 and 3+. Only four Generation 3 reactors have operated, so far only in Japan, and their performance has been poor. No Generation 3+ reactor is operating, although two are under construction in Europe, four in the USA and several in China. All are behind schedule and over-budget – the incomplete European reactors are already triple their budgeted prices. Not one Generation 4 power reactor – e.g. fast breeder, integral fast reactor (IFR), small modular reactor – is commercially available. ([World Nuclear Industry Status Report](http://www.worldnuclearreport.org/) 2015) So it can be argued that modern nuclear energy is not ready. On the other hand, wind and solar are both growing rapidly and are still becoming cheaper. Large wind and solar farms can be planned and built in 2-3 years (compared with 10-15 years for nuclear) and are ready now to replace fossil and nuclear electricity. Myth 4: Nuclear weapons proliferation is independent of civil nuclear energy. Variant: Nuclear weapons explosives cannot be made from the type of plutonium produced in conventional nuclear power reactors, or from the thorium fuel cycle, or from the IFR. Six countries (France, India, North Korea, Pakistan, South Africa and the UK) have covertly used civil nuclear energy to assist them to develop nuclear weapons. In addition, at least seven countries (Argentina, Australia, Brazil, Iran, Libya, South Korea and Taiwan) have used civil nuclear energy to commence covertly developing nuclear weapons, but then terminated their programs (references in Diesendorf 2014). Thus nuclear energy is facilitating proliferation and therefore is increasing the probability of nuclear war. Even if the probability of nuclear war is small (and this is debatable), [the potential impacts are huge](http://www.scientificamerican.com/article/local-nuclear-war/). Therefore it is inappropriate to ignore the proliferation risk, which is probability multiplied by potential impact. Thorium reactors are under development in India. Thorium is not fissile, so it first has to be bombarded with neutrons to convert it into uranium-233, which is. Like any fissile element, U-233 can be used either to [generate heat and hence electricity, or as a nuclear explosive](http://www.nature.com/nature/journal/v492/n7427/full/492031a.html). Nuclear weapons with U-233 as part of the explosive have been tested by the USA ([Teapot MET test](http://nuclearweaponarchive.org/Usa/Tests/Teapot.html)), Soviet Union and India. Some nuclear proponents claim incorrectly that the hypothetical IFR would be proliferation-proof. The IFR has only ever operated as a single prototype in the USA. The project was cancelled by Congress in 1994 for reasons including funding, doubts about whether it was needed, and concerns about its potential for proliferation (Kerry 1994). The IFR offers at least two proliferation pathways. Once it has separated most of the highly radioactive fission products from the less radioactive transuranics by means of an experimental process known as pyroprocessing, it would be easier to extract the plutonium-239 from the transuranics by means of conventional chemical reprocessing and use it to produce nuclear weapons. An alternative proliferation pathway would be to modify an IFR to enable it to be used as a breeder reactor to [produce weapons grade plutonium from uranium-238](http://www.princeton.edu/~ota/disk1/1994/9434/9434.PDF) – see also Wymer et al. (1992). Myth 5: The death toll from the Chernobyl disaster was 28-64. These absurdly low estimates are obtained by considering only short-term deaths from acute radiation syndrome and ignoring the major contribution to fatalities, namely cancers that appear over several decades. For Chernobyl, the lowest serious estimate of future cancer deaths was ‘up to 4000’ by the Chernobyl Forum (2006), a group of United Nations agencies led by the International Atomic Energy Agency (IAEA), which has the conflicting goals of promoting nuclear energy and applying safeguards against inter alia accidents and proliferation. Estimates from authors with no obvious conflict of interest range from 16,000 from the [International Agency for Research on Cancer](https://www.researchgate.net/publication/7151231_Estimates_of_the_cancer_burden_in_Europe_from_radioactive_fallout_from_the_Chernobyl_accident) to 93,000 from a team of[international medical researchers from Ukraine, Russia and elsewhere](http://www.greenpeace.org/international/Global/international/planet-2/report/2006/4/chernobylhealthreport.pdf). Myth 6: The problem of permanently storing high-level nuclear wastes has been solved. All high-level waste is currently in temporary storage in pools or dry casks. Not one permanent repository is operating in the world. Development of the proposed US repository at Yucca Mountain in the USA was terminated after expenditure of $13.5 billion. Underground repositories are under construction in Sweden and Finland. Even if the technical and economic challenges could be solved, the social problem of managing or isolating the repositories for 100,000 years remains. Myth 7: The IFR could ‘burn up’ the world’s nuclear wastes. The IFR only exists as a design. If it were ever developed, it would become another proliferation pathway (see Myth 4). At best it could convert most transuranics to fission products, so underground long-term repositories would still be needed for the highly radioactive fission products. For a fuller exposition of the problems of IFRs and other ‘new’ reactor designs, see Amory Lovins’s classic 2009 essay, recently republished on The Ecologist: ‘ [“New” nuclear reactors? same old story](http://www.theecologist.org/essays/2987536/new_nuclear_reactors_same_old_story.html)‘. Myth 8: Nuclear energy emits no or negligible greenhouse gas emissions. Neither nuclear energy nor most renewable technologies emit CO2 during operation. However, meaningful comparisons must compare whole life-cycles from mining the raw materials to managing the wastes. Nuclear physicist and nuclear supporter Manfred Lenzen [found](http://www.energiasostenible.org/mm/file/GCT2008%20Doc_ML-LCE%26Emissions.pdf) average life-cycle emissions for nuclear energy, based on mining high-grade uranium ore, of 60 grams of CO2 per kilowatt-hour (g/kWh), for wind of 10–20 g/kWh and for natural gas 500–600 g/kWh. Now comes the part that most nuclear proponents try to ignore or misrepresent. The world has only a few decades of high-grade uranium ore reserves left. As the ore-grade inevitably declines, the fossil fuel used to mine (with diesel fuel) and mill uranium increases and so do the resulting greenhouse gas (GHG) emissions. Lenzen [calculates](http://www.energiasostenible.org/mm/file/GCT2008%20Doc_ML-LCE%26Emissions.pdf) that, when low-grade uranium ore is used, the life-cycle GHG emissions will increase to 131 g/kWh. Others have obtained higher levels. This is [unacceptable in terms of climate science](http://theconversation.com/sure-lets-debate-nuclear-power-just-dont-call-it-low-emission-21566). Only if mining low-grade ore were done with renewable fuel, or if fast breeder reactors replaced burner reactors, could nuclear GHG emissions be kept to an acceptable level, but neither of these conditions is likely to be met for decades at least. For more on this topic, see Keith Barnham’s article ‘[False solution: nuclear power is not low carbon](http://www.theecologist.org/News/news_analysis/2736691/false_solution_nuclear_power_is_not_low_carbon.html)’. Myth 9: Nuclear energy is a suitable partner for renewable energy in the grid. Making a virtue out of necessity, nuclear proponents claim that we can have both (new) nuclear and renewables in the same grid. However, nuclear energy is a poor partner for a large contribution of variable renewable energy in an electricity supply system for four reasons: (1) Nuclear power reactors are inflexible in operation (see response to Myth 10), compared with open cycle gas turbines (which can be biofuelled), hydro with dams and concentrated solar thermal (CST) with thermal storage. Wind and solar PV can supply bulk energy, balanced by flexible, dispatchable renewables, as discussed [previously](http://reneweconomy.com.au/2016/dispelling-the-nuclear-baseload-myth-nothing-renewables-cant-do-better-94486). (2) When a nuclear power station breaks down, it is usually off-line for weeks or months. For comparison, lulls in wind last typically for hours or days, so wind does not need expensive back-up from base-load power stations – flexible dispatchable renewable energy suffices. (3) Wind and solar farms are cheaper to operate than nuclear (and fossil fuels). Therefore wind and solar can bid lower prices into electricity markets and displace nuclear from base-load operation, which it needs to pay off its huge capital costs. (4) Renewables and nuclear compete for support policies from government including scarce finance and subsidies. For example, the UK government commitment to Hinkley C, with enormous subsidies, has resulted in [removal of subsidies to on-shore wind and solar PV](http://www.theecologist.org/News/news_analysis/2960124/tories_attack_on_green_energy_threatens_climate_and_prosperity.html). Myth 10: Nuclear power reactors can generally be operated flexibly to follow changes in demand/load. The limitations, both technical and economic, are demonstrated by France, with 77% of its electricity generated from nuclear. Since the current generation of nuclear power stations is not designed for load-following, France can only operate some of its reactors in load-following mode some of the time – at the beginning of their operating cycle, with fresh fuel and high reserve reactivity – but cannot continue to load-follow in the late part of their cycle. This is acknowledged by the [World Nuclear Organisation](http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/france.aspx). Load-following has two economic penalties for base-load power stations: Substantially increased maintenance costs due to loss of efficiency. Reduced earnings during off-peak periods. Yet, to pay off of their high capital cost, the reactors must be operated as much as possible at rated power. France reduces the second economic penalty by selling its excess nuclear energy to neighbouring countries via transmission line, while parts of Australia soak up their excess base-load coal energy with cheap off-peak water heating. Myth 11: Renewable energies are more expensive than nuclear. Variant: Nuclear energy receives smaller subsidies than renewable energy. Both versions of the myth are false. Levelised costs of energy (LCOE) depend on the number of units installed at a site, location, capital cost, interest rate and capacity factor (actual average power output divided by rated power). LCOE estimates for nuclear are $108/MWh based on [pre-2014 data from the IPCC](http://www.ipcc.ch/report/ar5/wg3/) and $97-132/MWh based on [pre-2015 data from multinational financial consultants Lazard](https://www.lazard.com/perspective/levelized-cost-of-energy-analysis-90/). The IPCC cost estimate does not include subsidies, while the Lazard estimate includes US federal government subsidies excluding loan guarantees and decommissioning. None of these US estimates takes account of the huge escalation in costs of the two European Pressured Water Reactors (EPR) under construction (mentioned in Myth 3). The EPR proposed for the UK, Hinkley C, is being offered a guaranteed inflation-linked price for electricity over 35 years, commencing at £92.5/MWh (US$144/MWh) (2012 currency), more than double the wholesale price of electricity in the UK, together with a loan guarantee of originally £10 billion (US$15.3 billion). [Its capped liability for accidents and inadequate insurance](http://www.theecologist.org/blogs_and_comments/commentators/2265605/the_true_cost_of_disaster_insurance_makes_nuclear_power_uncompetitive.html) is likely to fall upon the British taxpayer. In 2015 [Lazard estimated](https://www.lazard.com/perspective/levelized-cost-of-energy-analysis-90/) unsubsidised costs for on-shore wind across the USA of US$32–77/MWh. An independent empirical study by [US Department of Energy](http://energy.gov/sites/prod/files/2015/08/f25/2014-Wind-Technologies-Market-Report-8.7.pdf) (Fig. 46) found levelised power purchase agreement prices in 2014 for wind in the US interior (region with the highest wind speeds) of US$22/MWh, and in the west (region with lowest wind speeds) about US$60/MW. The US government subsidises wind with a Production Tax Credit of US$23/MWh over 10 years, so this must be added to the DoE figures to obtain the actual costs. [In Brazil](http://www.gwec.net/wp-content/uploads/2015/03/GWEC_Global_Wind_2014_Report_LR.pdf) in 2014, contracts were awarded at a reverse auction for an average unsubsidised clearing price of 129.3 real/MWh (US$41/MWh). Lazard estimated unsubsidised costs of US$50–70/MWh for large-scale solar PV in a high insolation region of the USA. In New Mexico, USA, a Power Purchase Agreement for US$57.9/MWh has been signed for electricity from the Macho Springs 50 MW solar PV power station; federal and state subsidies bring the actual cost to around US$80–90/MWh depending on location. In Chile, Brazil and Uruguay,unsubsidised prices at reverse auctions are in the same range (Diesendorf 2016). Rooftop solar ‘behind the meter’ is competitive with retail grid electricity prices in many regions of the world with medium to high insolation, even where there are no feed-in tariffs. For CST with thermal storage, Lazard estimates US$119-181/MWh. Comparing subsidies between nuclear and renewable energy is difficult, because they vary substantially in quantity and type from country to country, where nuclear subsidies may include some or all of the following (Diesendorf 2014): government funding for research and development, uranium enrichment, decommissioning and waste management; loan guarantees; stranded assets paid for by taxpayers and electricity ratepayers; limited liabilities for accidents covered by victims and taxpayers; generous contracts for difference. Subsidies to nuclear have either remained constant or increased over the past 50 years, while subsidies to renewable energy, especially feed-in tariffs, have decreased substantially (to zero in some places) over the past decade. Myth 12: Renewable energy is very diffuse and hence requires huge land areas. Hydro-electric dams and dedicated bioenergy crops can occupy large areas, but renewable energy scenarios for few regions have large additional contributions from these sources. Solar farms located on-ground may occupy significant land, often marginal land. Rooftop solar, which is widespread in Germany and Australia, and bioenergy derived from crop residues occupy no additional land. On-shore wind farms are generally located on agricultural land, with which they are highly compatible. The land occupied is[typically 1-2% of the land spanned](ftp://ftp.manomet.org/WildlifeandEnergy/Literature_8July10/NREL_Land_Use_2009.pdf). renewable energy deniers often ignore this and misleadingly quote the land area spanned. For an economic optimal mix of 100% renewable electricity technologies calculated for the Australian National Energy Market, total land area in km2/TWh/y is about half that of equivalent nuclear with a hypothetical buffer zone of radius 20 km, as belatedly established for Fukushima Daiichi (Diesendorf 2016). Myth 13: Energy payback periods (in energy units, not money) of renewable energy technologies are comparable with their lifetimes. Nowadays typical energy payback periods in years are: solar PV modules 0.5-1.8; large wind turbines 0.25-0.75; CST (parabolic trough) 2; nuclear (high-grade-uranium ore) 6.5; nuclear (low-grade-uranium ore) 14 (references in Diesendorf 2014, Table 5.2). The range of values reflects the fact that energy payback periods, and the related concept of energy return on energy invested, depend on the type of technology and its site. Critics of renewable energy often quote much higher energy payback periods for renewable energy technologies by [assuming incorrectly that each has to be backed-up continuously by a fossil fuelled power station](http://reneweconomy.com.au/2016/dispelling-the-nuclear-baseload-myth-nothing-renewables-cant-do-better-94486). Myth 14: Danish electricity prices are among the highest in Europe, because of the large contribution from wind energy. Danish retail electricity prices are among the highest in Europe, because electricity is taxed very heavily. This tax goes into consolidated revenue – it does not subsidise wind energy. [Comparing tax-free electricity prices](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Electricity_prices_for_household_consumers,_second_half_2014_(%C2%B9)_(EUR_per_kWh)_YB15.png) places Denmark around the European average. Wind energy in Denmark is subsidised by feed-in tariffs funded by a very small increase in retail electricity prices, which [is offset by the decrease in wholesale electricity prices](http://www.energyplanning.aau.dk/) resulting from the large wind energy contribution. Myth 15: Computer simulation models of the operation of electricity grids with 80-100% renewable electricity are meaningless over-simplifications of real systems. Although a model is indeed a simplified version of reality, it can be a powerful low-cost tool for exploring different scenarios. Most modellers start with simple models, in order to understand some of the basic relationships between variables. Then, step-by-step, as understanding grows, they make the models more realistic. For example, [initially](http://www.ceem.unsw.edu.au/sites/default/files/documents/simulations.pdf) the UNSW Australia group simulated the operation of the Australian National Electricity Market with 100% renewable energy in hourly time-steps spanning a single year. Wind farms were simply scaled up at existing sites. The [next model](http://ceem.unsw.edu.au/sites/default/files/documents/LeastCostElectricityScenariosInPress2013.pdf) included economic data and calculated the economic optimal mix of renewable energy technologies and then [compared costs with low-carbon fossil fuelled scenarios](http://ceem.unsw.edu.au/sites/default/files/documents/Low%20Emission%20Fossil%20Scenarios.pdf). [Recently the simulations were extended](http://ceem.unsw.edu.au/sites/default/files/documents/WhatCostMoreRenewables-preprint_0.pdf) to six years of hourly data, the renewable energy supply region was decomposed into 43 sub-regions and a limit was imposed on non-synchronous supply. With all these refinements in the model, the 100% renewable energy system is still found to be reliable and affordable. Meanwhile, [researchers at Stanford University have shown](http://web.stanford.edu/group/efmh/jacobson/Articles/I/CombiningRenew/CONUSGridIntegration.pdf) that all energy use in the USA, including transport and heat, could be supplied by renewable electricity. Their computer simulations use synthetic data on electricity demand, wind and sunshine taken every 30 seconds over a period of six years. Using synthetic data allows modellers to include big hypothetical fluctuations in the weather. Such sensitivity analysis strengthens the power and credibility of the models. Strangely, some of the loudest critics of simulation modeling of electricity systems, a specialised field, have no qualifications in physical science, computer science, engineering or applied mathematics. In Australia they include two biologists, a social work academic and an occupational therapist. Conclusion Computer simulation models and growing practical experience suggest that electricity supply in many regions, and possibly the whole world, could transition to 100% renewable energy. Most of the renewable energy technologies are commercially available, affordable and environmentally sound. There is no fundamental technical or economic reason for delaying the transition. The pro-nuclear and anti-renewable energy myths disseminated by nuclear proponents and supporters of other vested interests do not stand up to examination. Given the political will, renewable energy could be scaled up long before Generation 3 and 4 nuclear power stations could make a significant contribution to electricity supply.

## A2 imperialism

#### The aff is literally the alternative – changing the representations of borders and boundaries is a prerequisite to determining the consequences of imperialism. Cross apply Rozman – banning nuclear power actual solves or is a step to stopping the need for colonial imposition.

#### First overview. The concept of defining “countries” and boundaries is a colonial strategy to commodify indigenous selfhood. Their boundary-based logic is an attempt to colonize Native lands and subvert Native sovereignty. We must redraw the map.

Reed 09 (T. V. Reed, Toxic Colonialism, Environmental Justice, and Native Resistance in Silko's "Almanac of the Dead", 2009, Oxford University Press, Accessed 8/20/16, <http://www.jstor.org/stable/20532677>, p 32, T. V. Reed is director of American studies and professor of English at Washington State University. //GK)

Not only are the forces of resistance far from pure, but they also are portrayed as facing deeply disturbing, dehumanizing forces arising from colonialist capitalism's increasing objectification, commoditization, and degradation of people and environments. The logic of economic objectification and the text's strategy of countering it are apparent even before the novel officially begins, in the map that precedes the first chapter. Mapping was one of the key objectifying strategies that enabled colonialist expropriation, and thus might seem a strange place for the text to begin. But this map is quite subversive. While it shows that imaginary line called a border, it labels only Mexico, not that other place even farther from God. The map is hardly to scale, and it is covered with names of characters and pithy encapsulations of prophecies that foretell "the disappearance of all things European" from the Americas and a revolutionary "return of all tribal lands." This reclaiming of mapping parallels the overall strategy of the text, which uses the Western literary form of the novel to offer a devastating critique of Euro-colonial culture and weaves into this alien literary form the prophetic counter-stories of the spiritually present ancestors and their living heirs.

## A2 thorium CP

#### Can’t solve terror – terrorists can use thorium reactors for nuclear weapons.

Wigeland 09

(Dr. Wigeland is currently a manager in the Nuclear Science & Technology Directorate at the Idaho National Laboratory; Roald Wigeland et al, "AFCI Options Study," Idaho National Laboratory, INL/EXT-10-17639, September 2009. Available at <http://www.inl.gov/technicalpublications/Documents/4480296.pdf>)

Some people believe that liquid fluoride thorium reactors, which would use a high-temperature liquid fuel made of molten salt, would be significantly safer than current-generation reactors. However, such reactors have major flaws. There are serious safety issues associated with the retention of fission products in the fuel, and it is not clear these problems can be effectively resolved. Such reactors also present proliferation and nuclear terrorism risks because they involve the continuous separation, or “reprocessing,” of the fuel to remove fission products and to efficiently produce U-233, which is a nuclear weapon-usable material. Moreover, disposal of the used fuel has turned out to be a major challenge. Stabilization and disposal of the remains of the very small "Molten Salt Reactor Experiment" that operated at Oak Ridge National Laboratory in the 1960s has turned into the most technically challenging cleanup problem that Oak Ridge has faced, and the site has still not been cleaned up.

#### The CP is simply a way for the State to decrease public hatred towards nuclear power and continue subsidizing this ruthless industry.

Rees 11

(EIfon Rees: writer for the Guardian, “Don’t Believe the Spin on Thorium Being a Greener Nuclear Option.” The Guardian, June 23, 2011, https://www.theguardian.com/environment/2011/jun/23/thorium-nuclear-uranium)

There is a significant sticking point to the promotion of thorium as the 'great green hope' of clean energy production: it remains unproven on a commercial scale. While it has been around since the 1950s (and an experimental 10MW LFTR did run for five years during the 1960s at Oak Ridge National Laboratory in the US, though using uranium and plutonium as fuel) it is still a next generation nuclear technology – theoretical. China did announce this year that it intended to develop a thorium MSR, but nuclear radiologist Peter Karamoskos, of the International Campaign to Abolish Nuclear Weapons (ICAN), says the world shouldn't hold its breath. 'Without exception, [thorium reactors] have never been commercially viable, nor do any of the intended new designs even remotely seem to be viable. Like all nuclear power production they rely on extensive taxpayer subsidies; the only difference is that with thorium and other breeder reactors these are of an order of magnitude greater, which is why no government has ever continued their funding.' China's development will persist until it experiences the ongoing major technical hurdles the rest of the nuclear club have discovered, he says. Others see thorium as a smokescreen to perpetuate the status quo: the world's only operating thorium reactor – India's Kakrapar-1 – is actually a converted PWR, for example. 'This could be seen to excuse the continued use of PWRs until thorium is [widely] available,' points out Peter Rowberry of No Money for Nuclear (NM4N) and Communities Against Nuclear Expansion (CANE). In his reading, thorium is merely a way of deflecting attention and criticism from the dangers of the uranium fuel cycle and excusing the pumping of more money into the industry. And yet the nuclear industry itself is also sceptical, with none of the big players backing what should be – in PR terms and in a post-Fukushima world – its radioactive holy grail: safe reactors producing more energy for less and cheaper fuel. In fact, a [2010 National Nuclear Laboratory (NNL) report (PDF)](http://www.nnl.co.uk/assets/_files/documents/jan_11/nex__1294397524_Thorium_Fuel_Cycle_-_Position_.pdf)concluded the thorium fuel cycle 'does not currently have a role to play in the UK context [and] is likely to have only a limited role internationally for some years ahead' – in short, it concluded, the claims for thorium were 'overstated'. Proponents counter that the NNL paper fails to address the question of MSR technology, evidence of its bias towards an industry wedded to PWRs. Reliant on diverse uranium/plutonium revenue streams – fuel packages and fuel reprocessing, for example – the nuclear energy giants will never give thorium a fair hearing, they say. But even were its commercial viability established, given 2010's soaring greenhouse gas levels, thorium is one magic bullet that is years off target. Those who support renewables say they will have come so far in cost and efficiency terms by the time the technology is perfected and upscaled that thorium reactors will already be uneconomic. Indeed, if renewables had a fraction of nuclear's current subsidies they could already be light years ahead. All other issues aside, thorium is still nuclear energy, say environmentalists, its reactors disgorging the same toxic byproducts and fissile waste with the same millennial half-lives. Oliver Tickell, author of Kyoto2, says the fission materials produced from thorium are of a different spectrum to those from uranium-235, but 'include many dangerous-to-health alpha and beta emitters'. Tickell says thorium reactors would not reduce the volume of waste from uranium reactors. 'It will create a whole new volume of radioactive waste from previously radio-inert thorium, on top of the waste from uranium reactors. Looked at in these terms, it's a way of multiplying the volume of radioactive waste humanity can create several times over.' Putative waste benefits – such as the impressive claims made by former Nasa scientist Kirk Sorensen, one of thorium's staunchest advocates – have the potential to be outweighed by a proliferating number of MSRs. There are already 442 traditional reactors already in operation globally, according to the International Atomic [Energy](https://www.theguardian.com/environment/energy) Agency. The by-products of thousands of smaller, ostensibly less wasteful reactors would soon add up. Anti-nuclear campaigner Peter Karamoskos goes further, dismissing a 'dishonest fantasy' perpetuated by the pro-nuclear lobby. Thorium cannot in itself power a reactor; unlike natural uranium, it does not contain enough fissile material to initiate a nuclear chain reaction. As a result it must first be bombarded with neutrons to produce the highly radioactive isotope uranium-233 – 'so these are really U-233 reactors,' says Karamoskos. This isotope is more hazardous than the U-235 used in conventional reactors, he adds, because it produces U-232 as a side effect (half life: 160,000 years), on top of familiar fission by-products such as technetium-99 (half life: up to 300,000 years) and iodine-129 (half life: 15.7 million years).Add in actinides such as protactinium-231 (half life: 33,000 years) and it soon becomes apparent that thorium's superficial cleanliness will still depend on digging some pretty deep holes to bury the highly radioactive waste. With billions of pounds already spent on nuclear research, reactor construction and decommissioning costs – dwarfing commitments to renewables – and proposed reform of the UK electricity markets apparently hiding subsidies to the nuclear industry, the thorium dream is considered by many to be a dangerous diversion. Energy consultant and former Friends of the Earth anti-nuclear campaigner Neil Crumpton says the government would be better deferring all decisions about its new nuclear building plans and fuel reprocessing until the early 2020s: 'By that time much more will be known about Generation IV technologies including LFTRs and their waste-consuming capability.' In the meantime, says Jean McSorley, senior consultant for Greenpeace's nuclear campaign, the pressing issue is to reduce energy demand and implement a major renewables programme in the UK and internationally – after all, even conventional nuclear reactors will not deliver what the world needs in terms of safe, affordable electricity, let alone a whole raft of new ones. 'Even if thorium technology does progress to the point where it might be commercially viable, it will face the same problems as conventional nuclear: it is not renewable or sustainable and cannot effectively connect to smart grids. The technology is not tried and tested, and none of the main players is interested. Thorium reactors are no more than a distraction.'

#### Also, thorium reactors lead to PROLIF.

Parks et. al 12

(Dr Stephen F. Ashley and Dr. Geoffrey T. Parks from the University of Cambridge; Professor William J. Nuttall from The Open University; Professor Colin Boxall from Lancaster University; Professor Robin W. Grimes from Imperial College London; "Thorium: Proliferation warnings on nuclear 'wonder-fuel'"; 12-5-2012; Nature; <http://phys.org/news/2012-12-thorium-proliferation-nuclear-wonder-fuel.html>)

Thorium is being touted as an ideal fuel for a new generation of nuclear power plants, but in a piece in this week's Nature, researchers suggest it may not be as benign as portrayed. The element thorium, which many regard as a potential nuclear "wonder-fuel", could be a greater proliferation threat than previously thought, scientists have warned. Writing in a Comment piece in the new issue of the journal, Nature, nuclear energy specialists from four British universities suggest that, although thorium has been promoted as a superior fuel for future nuclear energy generation, it should not be regarded as inherently proliferation resistant. The piece highlights ways in which small quantities of uranium-233, a material useable in nuclear weapons, could be produced covertly from thorium, by chemically separating another isotope, protactinium-233, during its formation. The chemical processes that are needed for protactinium separation could possibly be undertaken using standard lab equipment, potentially allowing it to happen in secret, and beyond the oversight of organisations such as the International Atomic Energy Agency (IAEA), the paper says. The authors note that, from previous experiments to separate protactinium-233, it is feasible that just 1.6 tonnes of thorium metal would be enough to produce 8kg of uranium-233 which is the minimum amount required for a nuclear weapon. Using the process identified in their paper, they add that this could be done "in less than a year." "Thorium certainly has benefits, but we think that the public debate regarding its proliferation-resistance so far has been too one-sided," Dr Steve Ashley, from the Department of Engineering at the University of Cambridge and the paper's lead author, said. "Small-scale chemical reprocessing of irradiated thorium can create an isotope of uranium – uranium-233 – that could be used in nuclear weapons. If nothing else, this raises a serious proliferation concern."

#### PROLIF causes nuclear war.

Utgoff 02 Deputy Director of Strategy, Forces, and Resources Division of Institute for Defense Analysis [Victor A., “Proliferation, Missile Defence and American Ambitions,” Survival, Summer, p. 87-90]

Further, the large number of states that became capable of building nuclear weapons over the years, but chose not to, can be reasonably well explained by the fact that most were formally allied with either the United States or the Soviet Union. Both these superpowers had strong nuclear forces and put great pressure on their allies not to build nuclear weapons. Since the Cold War, the US has retained all its allies. In addition, NATO has extended its protection to some of the previous allies of the Soviet Union and plans on taking in more. Nuclear proliferation by India and Pakistan, and proliferation programmes by North Korea, Iran and Iraq, all involve states in the opposite situation: all judged that they faced serious military opposition and had little prospect of establishing a reliable supporting alliance with a suitably strong, nuclear-armed state. What would await the world if strong protectors, especially the United States, were [was] no longer seen as willing to protect states from nuclear-backed aggression? At least a few additional states would begin to build their own nuclear weapons and the means to deliver them to distant targets, and these initiatives would spur increasing numbers of the world’s capable states to follow suit. Restraint would seem ever less necessary and ever more dangerous. Meanwhile, more states are becoming capable of building nuclear weapons and long-range missiles. Many, perhaps most, of the world’s states are becoming sufficiently wealthy, and the technology for building nuclear forces continues to improve and spread. Finally, it seems highly likely that at some point, halting proliferation will come to be seen as a lost cause and the restraints on it will disappear. Once that happens, the transition to a highly proliferated world would probably be very rapid. While some regions might be able to hold the line for a time, the threats posed by wildfire proliferation in most other areas could create pressures that would finally overcome all restraint. Many readers are probably willing to accept that nuclear proliferation is such a grave threat to world peace that every effort should be made to avoid it. However, every effort has not been made in the past, and we are talking about much more substantial efforts now. For new and substantially more burdensome efforts to be made to slow or stop nuclear proliferation, it needs to be established that the highly proliferated nuclear world that would sooner or later evolve without such efforts is not going to be acceptable. And, for many reasons, it is not. First, the dynamics of getting to a highly proliferated world could be very dangerous. Proliferating states will feel great pressures to obtain nuclear weapons and delivery systems before any potential opponent does. Those who succeed in outracing an opponent may consider preemptive nuclear war before the opponent becomes capable of nuclear retaliation. Those who lag behind might try to preempt their opponent’s nuclear programme or defeat the opponent using conventional forces. And those who feel threatened but are incapable of building nuclear weapons may still be able to join in this arms race by building other types of weapons of mass destruction, such as biological weapons. Second, as the world approaches complete proliferation, the hazards posed by nuclear weapons today will be magnified many times over. Fifty or more nations capable of launching nuclear weapons means that the risk of nuclear accidents that could cause serious damage not only to their own populations and environments, but those of others, is hugely increased. The chances of such weapons failing into the hands of renegade military units or terrorists is far greater, as is the number of nations carrying out hazardous manufacturing and storage activities. Worse still, in a highly proliferated world there would be more frequent opportunities for the use of nuclear weapons. And more frequent opportunities means shorter expected times between conflicts in which nuclear weapons get used, unless the probability of use at any opportunity is actually zero. To be sure, some theorists on nuclear deterrence appear to think that in any confrontation between two states known to have reliable nuclear capabilities, the probability of nuclear weapons being used is zero.’ These theorists think that such states will be so fearful of escalation to nuclear war that they would always avoid or terminate confrontations between them, short of even conventional war. They believe this to be true even if the two states have different cultures or leaders with very eccentric personalities. History and human nature, however, suggest that they are almost surely wrong**.** History includes instances in which states ‘known to possess nuclear weapons did engage in direct conventional conflict. China and Russia fought battles along their common border even after both had nuclear weapons. Moreover, logic suggests that if states with nuclear weapons always avoided conflict with one another, surely states without nuclear weapons would avoid conflict with states that had them. Again, history provides counter-examples Egypt attacked Israel in 1973 even though it saw Israel as a nuclear power at the time. Argentina invaded the Falkland Islands and fought Britain’s efforts to take them back, even though Britain had nuclear weapons. Those who claim that two states with reliable nuclear capabilities to devastate each other will not engage in conventional conflict risking nuclear war also assume that any leader from any culture would not choose suicide for his nation. But history provides unhappy examples of states whose leaders were ready to choose suicide for themselves and their fellow citizens. Hitler tried to impose a ‘victory or destruction’’ policy on his people as Nazi Germany was going down to defeat. And Japan’s war minister, during debates on how to respond to the American atomic bombing, suggested ‘Would it not be wondrous for the whole nation to be destroyed like a beautiful flower?” If leaders are willing to engage in conflict with nuclear-armed nations, use of nuclear weapons in any particular instance may not be likely, but its probability would still be dangerously significant. In particular, human nature suggests that the threat of retaliation with nuclear weapons is not a reliable guarantee against a disastrous first use of these weapons. While national leaders and their advisors everywhere are usually talented and experienced people, even their most important decisions cannot be counted on to be the product of well-informed and thorough assessments of all options from all relevant points of view. This is especially so when the stakes are so large as to defy assessment and there are substantial pressures to act quickly, as could be expected in intense and fast-moving crises between nuclear-armed states. Instead, like other human beings, national leaders can be seduced by wishful thinking. They can misinterpret the words or actions of opposing leaders. Their advisors may produce answers that they think the leader wants to hear, or coalesce around what they know is an inferior decision because the group urgently needs the confidence or the sharing of responsibility that results from settling on something. Moreover, leaders may not recognize clearly where their personal or party interests diverge from those of their citizens. Under great stress, human beings can lose their ability to think carefully. They can refuse to believe that the worst could really happen, oversimplify the problem at hand, think in terms of simplistic analogies and play hunches. The intuitive rules for how individuals should respond to insults or signs of weakness in an opponent may too readily suggest a rash course of action. Anger, fear, greed, ambition and pride can all lead to bad decisions. The desire for a decisive solution to the problem at hand may lead to an unnecessarily extreme course of action. We can almost hear the kinds of words that could flow from discussions in nuclear crises or war. ‘These people are not willing to die for this interest’. ‘No sane person would actually use such weapons’. ‘Perhaps the opponent will back down if we show him we mean business by demonstrating a willingness to use nuclear weapons’. ‘If I don’t hit them back really hard, I am going to be driven from office, if not killed’. Whether right or wrong, in the stressful atmosphere of a nuclear crisis or war, such words from others, or silently from within, might resonate too readily with a harried leader. Thus, both history and human nature suggest that nuclear deterrence can be expected to fail from time to time, and we are fortunate it has not happened yet. But the threat of nuclear war is not just a matter of a few weapons being used. It could get much worse. Once a conflict reaches the point where nuclear weapons are employed, the stresses felt by the leaderships would rise enormously. These stresses can be expected to further degrade their decision-making. The pressures to force the enemy to stop fighting or to surrender could argue for more forceful and decisive military action, which might be the right thing to do in the circumstances, but maybe not. And the horrors of the carnage already suffered may be seen as justification for visiting the most devastating punishment possible on the enemy.’ Again, history demonstrates how intense conflict can lead the combatants to escalate violence to the maximum possible levels. In the Second World War, early promises not to bomb cities soon gave way to essentially indiscriminate bombing of civilians. The war between Iran and Iraq during the 1980s led to the use of chemical weapons on both sides and exchanges of missiles against each other’s cities. And more recently, violence in the Middle East escalated in a few months from rocks and small arms to heavy weapons on one side, and from police actions to air strikes and armoured attacks on the other. Escalation of violence is also basic human nature. Once the violence starts, retaliatory exchanges of violent acts can escalate to levels unimagined by the participants before hand. Intense and blinding anger is a common response to fear or humiliation or abuse. And such anger can lead us to impose on our opponents whatever levels of violence are readily accessible. In sum, widespread proliferation is likely to lead to an occasional shoot-out with nuclear weapons, and that such shoot-outs will have a substantial probability of escalating to the maximum destruction possible with the weapons at hand. Unless nuclear proliferation is stopped, we are headed toward a world that will mirror the American Wild West of the late 1800s. With most, if not all, nations wearing nuclear ‘six-shooters’ on their hips, the world may even be a more polite place than it is today, but every once in a while we will all gather on a hill to bury the bodies of dead cities or even whole nations. This kind of world is in no nation’s interest. The means for preventing it must be pursued vigorously. And, as argued above, a most powerful way to prevent it or slow its emergence is to encourage the more capable states to provide reliable protection to others against aggression, even when that aggression could be backed with nuclear weapons. In other words, the world needs at least one state, preferably several, willing and able to play the role of sheriff, or to be members of a sheriff’s posse, even in the face of nuclear threats.

## A2 MSR CP

#### Can’t solve terror – terrorists can use molten salt reactors for nuclear weapons.

Wigeland 09

(Dr. Wigeland is currently a manager in the Nuclear Science & Technology Directorate at the Idaho National Laboratory; Roald Wigeland et al, "AFCI Options Study," Idaho National Laboratory, INL/EXT-10-17639, September 2009. Available at <http://www.inl.gov/technicalpublications/Documents/4480296.pdf>)

Some people believe that liquid fluoride thorium reactors, which would use a high-temperature liquid fuel made of molten salt, would be significantly safer than current-generation reactors. However, such reactors have major flaws**.** There are serious safety issues associated with the retention of fission products in the fuel, and it is not clear these problems can be effectively resolved. Such reactors also present proliferation and nuclear terrorism risks because they involve the continuous separation, or “reprocessing,” of the fuel to remove fission products and to efficiently produce U-233, which is a nuclear weapon-usable material. Moreover, disposal of the used fuel has turned out to be a major challenge. Stabilization and disposal of the remains of the very small "Molten Salt Reactor Experiment" that operated at Oak Ridge National Laboratory in the 1960s has turned into the most technically challenging cleanup problem that Oak Ridge has faced, and the site has still not been cleaned up.

#### Can’t solve biodiversity – MSRs emit radiation, are unsustainable and pose a meltdown threat.

Whittle 16

(Kari Whittle is the author of a book called “Nuclear Materials Science”, “The Challenges for Materials in New Reactor Designs”, http://iopscience.iop.org/chapter/978-0-7503-1104-5/bk978-0-7503-1104-5ch6, EmmieeM)

So far in this chapter we have looked at the impact of GenIV designs on fuel and cladding/containment, but there is one area that we have overlooked that impacts dramatically on the range of potential materials available for GenIV technologies. As part of the design process for the GenIV reactor family, extended operational life and higher burn-up of nuclear fuel are key goals. It would be expected that the materials within the reactor would experience higher levels of induced damage. Indeed, the expectation in the MSR design is for a level of damage approaching 150 dpa [1]. If the effects of damage are coupled with the expected temperature range within a core, the issue we discussed in chapters 2 and 5, this now becomes highly problematic. For example, how a material behaves when being damaged by neutrons at 1200 K can be dramatic, and could quickly lead to component failure. How can a system be designed that takes into account the effects of chemical corrosion and radiation damage? This is one of the key questions that need to be answered, and it is a particularly apt one for the MSR design. When considering the effects of radiation damage in reactor materials outside of the fuel, the damage mainly arises from neutron impact, as we discussed in chapter 2. The pressure vessel and those parts, which are not generally easily replaceable, do not experience very high levels, because of their distance from the source. In fuel, the damage arises from multiple sources, neutron impact, fission and fragment production, and radioactive decay. This form of damage can interact with the cladding present, modifying its properties, but this is replaced when the fuel is removed and is usually not load bearing within the core. Now consider a reactor design where the fuel is in direct contact with the containment, and where radiation damage can arise from this—what could happen? To answer this we need to remind ourselves of the outcome from fission, other than heat, and generally we would expect two or more fission fragments and some neutrons. Each of these particles will have a momentum that interacts with its local surroundings. Now consider these two scenarios: firstly, the fission happening in the centre of the fuel, away from containment, and secondly, an event in close proximity to the containment. What would be the outcome in each? In the first scenario, the containment is likely to be unaffected, as the molten salt will absorb most of the particle momentum, inducing further fission or dissolving the fission products. It is the second scenario that induces further damage, from the fission fragment and neutrons impacting on the material, as shown in figure 6.14. These events will cause radiation damage and induce cracking, stress/strain, volume expansion, etc., while they can also induce gas bubble formation, leading to more points of weakness in the material. Each of these outcomes is deleterious to the metallic structure, and we have overlooked the possibility of transmutation potentially modifying the composition of the alloy and inducing He bubble formation:

#### Cross-apply Lendman from the cyber flow – meltdown causes extinction.

#### Also, MSRs lead to noble gas fission, which damages the reactors.

Forsberg 2

(Dr. Charles W. Forsberg works for the Oak Ridge National Laboratory – this paper was made for The Americas Nuclear Energy Symposium, “Molten Salt Reactors (MSRs)”, http://www.torium.se/res/Documents/msrsforsberg.pdf. EmmieeM)

Noble metal disposition. Noble metal fission products that do not dissolve as stable fluorides can plate out on heat-exchanger walls as metal or lower-valence metal-metal bonded fluoride clusters. This is an operational issue that scales with the power level of the MSR. In the case of loss of heat sink, the decay-heat load from the metals could cause significant damage, leading to loss of integrity of the MSR intermediate heat exchanger. Several methods to address this issue have been proposed but R&D is required to develop an effective control system.

## A2 reprocessing

#### reprocessing tanks the global economy and fails due to technical issues.

Ramana & Hippel 13

(MV Ramana is with the Program on Science and Global Security at Princeton University Ramana is a member of IPFM and of the Science and Security Board of the Bulletin of the Atomic Scientists and the author of The Power of Promise: Examining Nuclear Energy in India; Frank von Hippel is with the Program on Science and Global Security at Princeton University. Hippel is the co-chair of the International Panel on Fissile Materials (IPFM) and co-author of Material Dangers, to be published by MIT Press "China must avoid costly trap of reprocessing nuclear fuel"; 12-7-2013; China Dialogue; <https://www.chinadialogue.net/article/show/single/en/6200-China-must-avoid-costly-trap-of-reprocessing-nuclear-fuel>)

The second problem with reprocessing is the huge expense, starting with the cost of constructing the reprocessing facility. Japan’s $20 billion (¥2.19 trillion) Rokkasho Reprocessing Plant, which was designed by AREVA, is a candidate for the most expensive single industrial facility in history. If it weren’t bad enough that it overran its construction budget (in 1989 an estimated $6.9 billion (¥760 billion), it failed to open in 2008 due to technical problems, and at the time of writing still isn't active. Japan’s Atomic Energy Commission has estimated that if the plant operated for 40 years, it would actually increase the cost of nuclear power in Japan by ¥10 trillion ($100 billion) more than if Japan simply stored its spent fuel. Even if China’s reprocessing plant doesn’t prove as expensive, there is little doubt that the cost of reprocessing spent fuel will be much higher than placing it in a repository. Primarily because of the high cost of reprocessing, the cost of MOX fuel is many times higher than that of standard uranium fuel. Because plutonium oxide is extremely carcinogenic if inhaled, MOX fuel, unlike uranium fuel, must be fabricated in sealed “glove boxes.” In France, even excluding the cost of reprocessing, the cost of MOX fuel fabrication is greater than the entire cost of uranium fuel, including that of mining uranium ore, processing the ore, enriching the uranium and making it into fuel.

## A2 Desal

#### Nuclear desalination intakes organisms and causes biodiversity loss.

Anastasov & Khamis 09

(Vladimir Anastasov is an Environmental Consultant at the IAEA, working with the Nuclear Power Technology Development Section. He obtained his M.Sc. degree in Environmental Sciences and Policy at the CE University in Budapest, Hungary; I. Khamis earned his MSc in 1986 and his PhD in 1988 in Nuclear Engineering from the University of Arizona, Tucson, Arizona, USA. Since 2006, he has been the Project Manager for nonelectric applications of nuclear energy at the Nuclear Power Technology Development Section, Division of Nuclear Power, IAEA; “JEM Spotlight: Nuclear desalination—environmental impacts and implications for planning and monitoring activities†”; Journal of Environmental Monitoring – The Royal Society of Chemistry; 11th July 2009; <http://pubs.rsc.org/en/content/articlepdf/2010/EM/B907794D>)

Apart from being a resource and waste sink for nuclear desalination purposes, the oceans also represent a habitat rich in biodiversity. Coastal waters, host sensitive marine ecosystems and, not surprisingly, significant portion of the scientific literature on seawater desalination is dedicated to the specific environmental impacts it has on the marine environment, especially through concentrate discharge. However, new studies have shifted the focus by suggesting greater marine environmental impacts from direct intakes rather than brine discharges, even for stand-alone desalination operations,4 through entrainment and impingement of organisms. Most of the adverse effects of co-located facilities are due to entrainment of massive numbers of fish eggs, larvae and plankton. For nuclear desalination the impingement of larger (adult) organisms, which is also known to add to these adverse effects, may even cause reactor shut-downs by blocking intakes.5 It is important to note that many factors contribute to the marine species’ demographics, and their interactions are difficult to assess with the current knowledge on the subject. Yet, some of the fish species that have experienced population decline in Southern California were also noticed to be the ones with most entrained larvae,6 adding to arguments that intake systems may have a substantial environmental impact.

#### Can’t solve terror – nuclear desal still requires fabricate fuel and enriched uranium.

IAEA 2k

(International Atomic Energy Agency; “Introduction of Nuclear Desalination: A Guidebook”; TECHNICAL REPORTS SERIES No. 400; 2000; <http://www-pub.iaea.org/MTCD/publications/PDF/TRS400_scr.pdf>)

The adaptation of nuclear energy for desalination has two parts: the selection of the reactor type and the implementation of the nuclear fuel cycle (from the availability of uranium to the disposal of radioactive wastes). Each part involves the selection of technology options, which must be suited not only to water and power production but also to the natural and technological resource availability of the host country. Technically, any reactor type can be used for nuclear desalination, although several types are identified as the most practical and probable for this application. Particular attention is given to the technology of water cooled reactors because of their advanced state of development and deployment. These reactors are well proven, and the fuel, which uses natural uranium (NU) or low enriched uranium (LEU), is widely available.

#### Current reverse osmosis desalination is expanding and will solve.

Brabeck-Letmathe 14

(Peter Brabeck-Letmathe is an Austrian businessman. He is the chairman and former CEO of the Nestlé Group, and chairman of Formula One, universal access to water advocate; "Seawater desalination a solution to reduce water shortage "; 2-19-2014; https://www.water-challenge; <https://www.water-challenge.com/posts/seawater-desalination-%E2%80%93-a-solution-to-reduce-water-shortage>)

Seawater reverse osmosis (SWRO) used in desalination is the most energy efficient process, and has the largest market share today – 63% of the total worldwide installed capacity. Over the past 20 years, technological progress has helped to reduce the energy requirements used in SWRO (pdf document): The graph to the side from Yale University in 2012 suggests that such energy consumption is as low as 2 kWh (pdf document) per cubic metre. But this is still considerably higher than the 0.2 kWh per cubic metre, or even less, required for local fresh water supplies. There is still potential for further gains in energy efficiency of desalination. In 2013, researchers from the Massachusetts Institute of Technology designed a new type of membrane composed of a one-carbon atom thick sheet of graphene. Until now, it’s only a computer model but it may pave the way for further improvements in desalination energy efficiency. The theoretical minimum of energy required to remove 35 g/l of salt amounts to 0.8 kWh per cubic meter freshwater. This is the equivalent of the energy that would be generated when 'dissolving' the same amount of salt in water (law of conservation of energy). But getting to 0.8 kWh would need a perfect thermodynamic and mechanical system, which is not possible to build. Rather than trying to reach this limit, engineers are trying to get closer to it. Bigger is better Total cost also depends on the size of projects. As a rule of thumb, water produced in smaller plants – a few thousand cubic metres per day – would cost 3-5 times more than larger plants. A new plant due to start operations early this year will be located in Ras Al Khair in Saudi Arabia. It will be the largest hybrid desalination plant in the world combining thermal and membrane technologies to serve about 3.5 million people in the city of Riyadh. Part of the water debate There seems to be opportunities in desalination, especially as seawater is available in nearly unlimited amounts. Desalination looks set to become more energy efficient, with a further reduction in costs, and high growth rates for new desalination capacity will continue. But desalination is mainly a solution for communities based near a coast, as long-distance transfers of freshwater can be quite expensive. More desalination not only comes with high investment and running costs but also has direct and indirect environmental impact from the different types of energy used. From such insights, seawater desalination surely has its place in the global water debate. I w

## A2 SMR

#### Can’t solve terror – in fact, SMRs increase the terrorist threat.

**UCS 13**

#### Small Modular Nuclear Reactors Won’t Solve Nuclear Power’s Safety, Security and Cost Problems, New Report Finds. (2016). Union of Concerned Scientists. Retrieved 15 September 2016, from http://www.ucsusa.org/news/press\_release/small-modular-nuclear-reactor-0404.html#.V9q-npMrL-Y

WASHINGTON (September 26, 2013)—Nuclear power proponents pinning their hopes on small modular nuclear reactors to resurrect the industry’s fortunes will likely be disappointed, according to a report released today by the Union of Concerned Scientists (UCS). The report, [Small Isn’t Always Beautiful](http://www.ucsusa.org/nuclear_power/nuclear_power_technology/small-modular-reactors.html), concludes it will be extremely difficult for small reactors—which are less than a third the size of a standard 1,000-megawatt nuclear reactor—to generate less expensive electricity and, at the same time, be safer than their larger cousins. “Nuclear safety and security don’t come cheap,” said UCS Senior Scientist Edwin Lyman, the author of the report. “A utility that thinks it can have its own little nuclear reactor at a bargain-basement price may get exactly what it pays for: a plant more vulnerable to serious accidents and terrorist attacks.”

#### SMRs worsen biodiversity, cyber and are unsustainable.

Youngquest 16

(Judy; “The case against Small Modular Nuclear Reactors (SMRs)”; Nuclear Information; March 20, 2016; <https://nuclearinformation.wordpress.com/2016/03/20/the-case-against-small-modular-nuclear-reactors-smrs/>)

“Don’t bet against technology.” is the advice i give to people who are saying certain industrial developments won’t happen, or will not happen soon. There are breakthroughs everyday and most of them are not forecasted much in advance. So why am I not excited about the recent Department of Energy’s decision to fund the development of Small Modular Reactor (SMR) designs? So the hype runs like this. We want a reactor which is smaller because the big reactors are inflexible on the grid, often providing more power than an area (or even small countries) can use. Small is flexible. Small reactors can be built in factories and shipped to the site nearly complete – reversing the current ratio of 70% of the reactor built on site and 30% in the factory. Mass production will help avoid cost overruns and delays which plague larger reactors. Smaller reactors can be refueled less frequently and will require smaller staff to run them. We need a mix of energy solutions, rather than depending on just fossil sources and renewables. The navy has successfully used small reactors to power aircraft carriers and submarines successfully for years. Let’s just take this technology to the private sector. Sounds pretty compelling right? It is no surprise these reactors have broad bi-partisan support in congress. Small is flexible. But it turns out that 180 to 250 MW of these new designs is not actually small. The obstacle Germany and other countries face as they move to increasingly renewable solutions is that these big point source power producers interfere with grid distribution; basically renewable electricity has to be routed around them. This is why the closure of reactors is so important in terms of building a real flexible renewables feed network of microgrids. Big reactors are a big problem for the grid, these small reactors are still big enough to be a problem. It is certainly possible that small reactors could be built in factories and shipped to sites nearly complete. It is not a coincidence that large reactors have been built for so long and in so many places around the world by so many different engineering firms with some of the highest paid executives and engineers in the world. I don’t like them, but these are not stupid people. There are huge fixed costs associated with getting reactors running. You need tremendous water supplies**,** large grid connections**,** waste and fuel handling facilities – there are favorable economies of scale to large reactors. The reason dozens of engineering firms in over 30 countries around the globe have built big reactors (and multiple units wherever they could) is not because they all made the same mistake, it is because to make this huge investment even begin to make sense you need to do it in a big way. It is unclear if the mass production savings of SMRs will offset the economy of scale advantages of current designs. what is clear is that attempts to use modular components in the four AP1000s currently under construction in the US have utterly failed to keep costs down, or even controlled. And similarly this supposed benefit will not help the first handful of SMRs. The non-partisan group Taxpayers for Common Sense gaveSMR’s their Golden Fleece Award for using taxpayer money where business should be paying. The small reactors we find in nuclear military vessels produce electricity at ridiculously high prices per kilowatt. This is why no engineering firm is proposing these well understood designs for mass production. The cost of naval small reactor power never becomes competitive, even if mass produced. And nuclear naval vessels don’t have to worry about cooling water, making them structurally cheaper than the proposed new SMRs. The energy mix argument is a throwaway. We can generate energy by hooking teenagers with ipods up to stationary bicycles and running turbines. We don’t do this because it makes no economic sense. Neither do nukes, large or small. What is really happening is that the nuclear industry is not only not looking at the much hyped Renaissance, it is in its death throes. At what was perhaps the height of the so-called Nuclear Renaissance, October 2010, 17 companies and consortium were applying for licenses to build 30 reactors in US. But by the beginning of 2011 over half of these projects had been officially abandoned, with most of the rest quite unlikely to ever be built. Five reactors are under construction in the US, 2 in Georgia (Vogtle), 2 in South Carolina (VC Summer) and Watts Bar II in Tennessee which was started in 1973. All of these plants are delayed and overbudget, despite 4 of them having started construction in the last 18 months. Add to this the lower price of natural gas, the continuing decreasing cost of renewables, Fukushima market jitters, the Obama administration cutting loan guarantees for new reactor construction and there is not much of a future for old style large reactors. [It is worth noting in the first 10 months of 2012, renewable energy sources accounted for 46% of all new installed capacity in the US.] Small reactors reduce costs by eliminating the secondary containment**,** increasing the chances nuclear accidents will not be contained. There is still no rad-waste solution for these reactors. Oh, and there are not even any finished designs for these reactors, much less prototypes. Don’t bet against technology. But don’t waste billions and decades researching unproven designs which will likely never be economical, when there are safer, cleaner, cheaper solutions at hand. Union of Concerned Scientists updated critique of small reactors. Update July 2015: The GAO report recently released sees many problems with SMRs and advanced reactor designs, including the likely inferior cost profile compared with real renewables. More importantly, since this original writing Westinghouse has dropped out of SMR development citing that “there are no customers” Update January 2016 from the Ecologist Magazine: The US Government Accountability Office released a report in July 2015 on the status of small modular reactors (SMRs) and other ‘advanced’ reactor concepts in the US. The report concluded: “While light water SMRs and advanced reactors may provide some benefits, their development and deployment face a number of challenges … Depending on how they are resolved, these technical challenges may result in higher-cost reactors than anticipated, making them less competitive with large LWRs [light water reactors] or power plants using other fuels … “Both light water SMRs and advanced reactors face additional challenges related to the time, cost, and uncertainty associated with developing, certifying or licensing, and deploying new reactor technology, with advanced reactor designs generally facing greater challenges than light water SMR designs. “It is a multi-decade process, with costs up to $1 billion to $2 billion, to design and certify or license the reactor design, and there is an additional construction cost of several billion dollars more per power plant.”

#### Also, SMRs strain IAEA resources.

Lyman 11

(Edwin Lyman, Ph.D., Senior Scientist, Global Security Program Union of Concerned Scientists, 7/14/11, “An Examination of the Safety and Economics of Light Water Small Modular Reactors”, http://www.ucsusa.org/assets/documents/nuclear\_power/lyman-appropriations-subcom-7-14-11.pdf)

UCS is also concerned that reducing safety and security requirements for SMRs could facilitate their sale to utilities or other entities in the United States and abroad that do not have prior experience with nuclear power. Some SMR vendors argue that their technology is so safe that it can be deployed to remote areas, military bases, and countries in the developing world that have relatively low electric demand and no nuclear experience or emergency planning infrastructure. However, SMRs deployed in this manner could raise additional safety and security concerns compared to their deployment by established and experienced nuclear utilities. The distributed deployment of small reactors would also put great strains on existing licensing and inspection resources. Nuclear reactors are qualitatively different from other types of generating facilities, not least because they require a much more extensive safety and security inspection regime. Similarly, deployment of individual small reactors at widely distributed and remote sites around the world would strain the resources of the International Atomic Energy Agency (IAEA) and its ability to adequately safeguard reactors to guardagainst proliferation, since IAEA inspectors would need to visit many more locations per installed megawatt around the world. Maintaining robust oversight over vast networks of SMRs around the world would be difficult, if feasible at all. UCS believes that SMRs are only suitable for deployment where there is an established infrastructure to cope with emergencies, and if sufficient numbers of trained operator and security staff can be provided. It is unrealistic to assume the near-term availability of SMRs that are so safe they can be shipped around the world without the need to ensure the highest levels of competence and integrity of local regulatory authorities, plant operators, emergency planning organizations and security forces. Fukushima has demonstrated the importance of timely off-site response in the event of a severe accident, so the accessibility of reactors in remote locations also must be a prime consideration. Even within the U.S., small utilities with little or no experience in operating nuclear plants need to fully appreciate the unique challenges and responsibilities associated with nuclear power and should not expect that small modular reactors will provide any relief in this regard.

#### Resources are already strained now – additional stress causes nuclear proliferation.

IAEA Bulletin 16

(“Through safeguards, the IAEA provides credible assurances that States are honouring their international obligations to use nuclear material and technology only for peaceful purposes.”; June 2016; <https://www.iaea.org/sites/default/files/5720407_0.pdf>)

The objective of IAEA safeguards is to deter the proliferation of nuclear weapons through the early detection of the diversion of nuclear material or the misuse of nuclear technology and by providing credible assurance to the international community that States are honouring their safeguards obligations to use nuclear material and other nuclearrelated items subject to safeguards only for peaceful purposes. The number of nuclear facilities and the use of nuclear material continue to grow. With new nuclear power reactors under construction and a steady growth in the use of nuclear science and technology, the amount of material and number of facilities under IAEA safeguards is steadily increasing.

#### PROLIF causes nuclear war.

Utgoff 02

Deputy Director of Strategy, Forces, and Resources Division of Institute for Defense Analysis [Victor A., “Proliferation, Missile Defence and American Ambitions,” Survival, Summer, p. 87-90]

Further, the large number of states that became capable of building nuclear weapons over the years, but chose not to, can be reasonably well explained by the fact that most were formally allied with either the United States or the Soviet Union. Both these superpowers had strong nuclear forces and put great pressure on their allies not to build nuclear weapons. Since the Cold War, the US has retained all its allies. In addition, NATO has extended its protection to some of the previous allies of the Soviet Union and plans on taking in more. Nuclear proliferation by India and Pakistan, and proliferation programmes by North Korea, Iran and Iraq, all involve states in the opposite situation: all judged that they faced serious military opposition and had little prospect of establishing a reliable supporting alliance with a suitably strong, nuclear-armed state. What would await the world if strong protectors, especially the United States, were [was] no longer seen as willing to protect states from nuclear-backed aggression? At least a few additional states would begin to build their own nuclear weapons and the means to deliver them to distant targets, and these initiatives would spur increasing numbers of the world’s capable states to follow suit. Restraint would seem ever less necessary and ever more dangerous. Meanwhile, more states are becoming capable of building nuclear weapons and long-range missiles. Many, perhaps most, of the world’s states are becoming sufficiently wealthy, and the technology for building nuclear forces continues to improve and spread. Finally, it seems highly likely that at some point, halting proliferation will come to be seen as a lost cause and the restraints on it will disappear. Once that happens, the transition to a highly proliferated world would probably be very rapid. While some regions might be able to hold the line for a time, the threats posed by wildfire proliferation in most other areas could create pressures that would finally overcome all restraint. Many readers are probably willing to accept that nuclear proliferation is such a grave threat to world peace that every effort should be made to avoid it. However, every effort has not been made in the past, and we are talking about much more substantial efforts now. For new and substantially more burdensome efforts to be made to slow or stop nuclear proliferation, it needs to be established that the highly proliferated nuclear world that would sooner or later evolve without such efforts is not going to be acceptable. And, for many reasons, it is not. First, the dynamics of getting to a highly proliferated world could be very dangerous. Proliferating states will feel great pressures to obtain nuclear weapons and delivery systems before any potential opponent does. Those who succeed in outracing an opponent may consider preemptive nuclear war before the opponent becomes capable of nuclear retaliation. Those who lag behind might try to preempt their opponent’s nuclear programme or defeat the opponent using conventional forces. And those who feel threatened but are incapable of building nuclear weapons may still be able to join in this arms race by building other types of weapons of mass destruction, such as biological weapons. Second, as the world approaches complete proliferation, the hazards posed by nuclear weapons today will be magnified many times over. Fifty or more nations capable of launching nuclear weapons means that the risk of nuclear accidents that could cause serious damage not only to their own populations and environments, but those of others, is hugely increased. The chances of such weapons failing into the hands of renegade military units or terrorists is far greater, as is the number of nations carrying out hazardous manufacturing and storage activities. Worse still, in a highly proliferated world there would be more frequent opportunities for the use of nuclear weapons. And more frequent opportunities means shorter expected times between conflicts in which nuclear weapons get used, unless the probability of use at any opportunity is actually zero. To be sure, some theorists on nuclear deterrence appear to think that in any confrontation between two states known to have reliable nuclear capabilities, the probability of nuclear weapons being used is zero.’ These theorists think that such states will be so fearful of escalation to nuclear war that they would always avoid or terminate confrontations between them, short of even conventional war. They believe this to be true even if the two states have different cultures or leaders with very eccentric personalities. History and human nature, however, suggest that they are almost surely wrong**.** History includes instances in which states ‘known to possess nuclear weapons did engage in direct conventional conflict. China and Russia fought battles along their common border even after both had nuclear weapons. Moreover, logic suggests that if states with nuclear weapons always avoided conflict with one another, surely states without nuclear weapons would avoid conflict with states that had them. Again, history provides counter-examples Egypt attacked Israel in 1973 even though it saw Israel as a nuclear power at the time. Argentina invaded the Falkland Islands and fought Britain’s efforts to take them back, even though Britain had nuclear weapons. Those who claim that two states with reliable nuclear capabilities to devastate each other will not engage in conventional conflict risking nuclear war also assume that any leader from any culture would not choose suicide for his nation. But history provides unhappy examples of states whose leaders were ready to choose suicide for themselves and their fellow citizens. Hitler tried to impose a ‘victory or destruction’’ policy on his people as Nazi Germany was going down to defeat. And Japan’s war minister, during debates on how to respond to the American atomic bombing, suggested ‘Would it not be wondrous for the whole nation to be destroyed like a beautiful flower?” If leaders are willing to engage in conflict with nuclear-armed nations, use of nuclear weapons in any particular instance may not be likely, but its probability would still be dangerously significant. In particular, human nature suggests that the threat of retaliation with nuclear weapons is not a reliable guarantee against a disastrous first use of these weapons. While national leaders and their advisors everywhere are usually talented and experienced people, even their most important decisions cannot be counted on to be the product of well-informed and thorough assessments of all options from all relevant points of view. This is especially so when the stakes are so large as to defy assessment and there are substantial pressures to act quickly, as could be expected in intense and fast-moving crises between nuclear-armed states. Instead, like other human beings, national leaders can be seduced by wishful thinking. They can misinterpret the words or actions of opposing leaders. Their advisors may produce answers that they think the leader wants to hear, or coalesce around what they know is an inferior decision because the group urgently needs the confidence or the sharing of responsibility that results from settling on something. Moreover, leaders may not recognize clearly where their personal or party interests diverge from those of their citizens. Under great stress, human beings can lose their ability to think carefully. They can refuse to believe that the worst could really happen, oversimplify the problem at hand, think in terms of simplistic analogies and play hunches. The intuitive rules for how individuals should respond to insults or signs of weakness in an opponent may too readily suggest a rash course of action. Anger, fear, greed, ambition and pride can all lead to bad decisions. The desire for a decisive solution to the problem at hand may lead to an unnecessarily extreme course of action. We can almost hear the kinds of words that could flow from discussions in nuclear crises or war. ‘These people are not willing to die for this interest’. ‘No sane person would actually use such weapons’. ‘Perhaps the opponent will back down if we show him we mean business by demonstrating a willingness to use nuclear weapons’. ‘If I don’t hit them back really hard, I am going to be driven from office, if not killed’. Whether right or wrong, in the stressful atmosphere of a nuclear crisis or war, such words from others, or silently from within, might resonate too readily with a harried leader. Thus, both history and human nature suggest that nuclear deterrence can be expected to fail from time to time, and we are fortunate it has not happened yet. But the threat of nuclear war is not just a matter of a few weapons being used. It could get much worse. Once a conflict reaches the point where nuclear weapons are employed, the stresses felt by the leaderships would rise enormously. These stresses can be expected to further degrade their decision-making. The pressures to force the enemy to stop fighting or to surrender could argue for more forceful and decisive military action, which might be the right thing to do in the circumstances, but maybe not. And the horrors of the carnage already suffered may be seen as justification for visiting the most devastating punishment possible on the enemy.’ Again, history demonstrates how intense conflict can lead the combatants to escalate violence to the maximum possible levels. In the Second World War, early promises not to bomb cities soon gave way to essentially indiscriminate bombing of civilians. The war between Iran and Iraq during the 1980s led to the use of chemical weapons on both sides and exchanges of missiles against each other’s cities. And more recently, violence in the Middle East escalated in a few months from rocks and small arms to heavy weapons on one side, and from police actions to air strikes and armoured attacks on the other. Escalation of violence is also basic human nature. Once the violence starts, retaliatory exchanges of violent acts can escalate to levels unimagined by the participants before hand. Intense and blinding anger is a common response to fear or humiliation or abuse. And such anger can lead us to impose on our opponents whatever levels of violence are readily accessible. In sum, widespread proliferation is likely to lead to an occasional shoot-out with nuclear weapons, and that such shoot-outs will have a substantial probability of escalating to the maximum destruction possible with the weapons at hand. Unless nuclear proliferation is stopped, we are headed toward a world that will mirror the American Wild West of the late 1800s. With most, if not all, nations wearing nuclear ‘six-shooters’ on their hips, the world may even be a more polite place than it is today, but every once in a while we will all gather on a hill to bury the bodies of dead cities or even whole nations. This kind of world is in no nation’s interest. The means for preventing it must be pursued vigorously. And, as argued above, a most powerful way to prevent it or slow its emergence is to encourage the more capable states to provide reliable protection to others against aggression, even when that aggression could be backed with nuclear weapons. In other words, the world needs at least one state, preferably several, willing and able to play the role of sheriff, or to be members of a sheriff’s posse, even in the face of nuclear threats.

## AT Kant NC

#### Kantianism is not applicable to scenarios surrounding nuclear policy- it wrongfully assumes ideal conditions and stunts effective policymaking. Doyle 10.

Doyle, Thomas E. "Kantian Nonideal Theory and Nuclear Proliferation." *Int. Theory International Theory* 2.01 (2010): 87. Web. 10 Aug. 2016. Department of Political Science, School of Social Science, University of California JZ \*brackets in original text\*

In the 1980s, Kantian-leaning theorists criticized superpower nuclear deterrence based on various formulations of the Categorical Imperative (Churchill, 1983; Donaldson, 1985; Lee, 1985). One formulation states, ‘So act that you use humanity, whether in your own person or in the person of any other, always at the same time as an end, and never merely as a means’ (GMM 4:429). This ‘Formula of Humanity’ prescribes an ideal criterion for the assessment of rules for interpersonal and international conduct (Korsgaard, 1996). It acknowledges that, in daily life, the beneﬁt of any individual’s talent or labor must often accrue to others, that is, at times all individuals are treated as means for the ends of others. Evenso, the Categorical Imperative requires that any use of persons must be consistent with a regard for human beings as ends in themselves, as havingautonomy and dignity. This requirement is applied by asking actors to imagine in concrete cases of choice and action whether or not individuals could in principle rationally consent to the uses imposed on them from which they do not beneﬁt. The important question to ask is whether the principles governing the uses of humanity by nuclear deterrence institutions are con-sistent with regarding self and others as an end and not merely as a means. I will review in turn two such principles discussed in the Cold War nuclear ethics literature – that is, the Wrongful Intentions Principle and the Principle of the Morality of Social Institutions. The Wrongful Intentions Principle dictates that it is wrong to intend to do something that it is wrong to do. It is, for instance, wrong to murder or kidnap others and it is wrong to intend to commit those acts. Accordingly, the argument against nuclear deterrence by Kantians during the Cold Waris that (1) it is wrong to use people within national defense institutions to carry out nuclear warfare and, hence, (2) it is wrong to issue threats to other countries requiring the creation and administration of institutions to carry out nuclear warfare if deterrence fails (Kavka, 1978; Tucker,1985). Now, under ideal conditions, the need for nuclear (and perhaps conventional) deterrence would not arise. But, under the kind of anarchy that corresponds to the present world system (Bull, 1977; Wendt, 1999; Lebow, 2003), where a few countries are nuclear-armed and the rest are not, it might seem that the Wrongful Intentions Principle – or the Categorical Imperative itself – is insensitive to the ethical requirement to prevent the evils of nuclear aggression. A rigorous adherence to right action and intention regardless of the outcomes might have the perverse effect of permitting evil outcomes. This is one reason advanced by realists to think that Kantian ideal moral theory is not adequately equipped to deal with the issue of nuclear security threats and the need for deterrence (Nye, 1986).

## AT Virtue Ethics NC

#### 1 Virtue Ethics are abstract abstract because assumes virtues apply to all same – ignores social identity

#### 2 there's no way to determine the content of virtue so it's a pointless ethical project. Terminal defense on the NC

#### 3 Even if we could interpret virtue there's no underlying ethic of reason that ensures we'd cohere with virtue in a way that allows for an ethical community

#### 4 it assumes morality exists in the world prima facie, but morality is a social construct I.e even if it exists it's only useful to us in a social context in which case virtue would be socially created rather than somehow "found"

#### 5. Aff meets – everything about the aff is virtuous and bs reasons it could be a virtue

### AT Levinas NC

#### Nuclear power acts with the rest of technology to reduce the expression of the other and create inauthentic relationships. Caygill.

Caygill 02, Howard. Levinas and the Political. London: Routledge, 2002. Print. Kingston University London Professor of Modern European Philosophy JZ

The inhuman biological race war that characterised the National Socialist political has now become the inhuman nuclear war between the superpowers. The powers released by nuclear technology no longer possess any human significance beyond their potential to destroy human life. The apparent struggle between the capitalist and socialist systems for world domination is regarded by Levinas as a war of shadows that exemplifies an historical predicament in which 'human conflict has lost all meaning without the struggle having come to an end' (11-1, 161). The development of atomic technology is understood by Levinas to mark the end of human history: 'the release of atomic energy has precisely taken the control of the real away from human will. This is exactly what is meant by the arrest of history' (IH, 161). Not only does human struggle no longer possess[es] any meaning or direction, but its lack of orientation signifies a fundamental transformation of the political. It is a transformation that, at this stage in his thought, Levinas takes to mark the end of a certain human history and he beginning of an inhuman history. Levinas extends the line of thought opened in the 'Reflections on Hitlerism' by regarding the inhuman in terms of a regression to the animal. Later, in the audacious essay of 1961 `Heidegger, Gagarin and Us', the inhuman character of technology is understood in terms of the divine inhuman, or the promise of a univer-sality that closes a human history based on territory and place while opening the possibility of a new human history organised around the nudity of the face of the other. In 1956 Levinas describes the link between the arrest of history and the transformation of the political by means of the concept of the 'third'. While the 'third' usually signifies for Levinas the political as opposed to the 'second' or other of ethics, the 'third' serving as shorthand for the impersonal institutions of legal and political judgement, here it denotes precisely the inhuman. Levinas writes of the summit negotiations that 'The third partner here is not the third man. It does not assume human form, they are forces without faces. Strange return of the natural powers...' (IH, 161). The 'forces without faces' will return again in the 1960 Esprit article 'Principles and Faces'; in both cases they signify the same forces of fatality that drove the racial struggle described in the Hitlerism essay. In 1934, human struggle was overshadowed by a struggle between the inhuman biological forces of race; here human struggle is overshadowed by the inhuman scale of the destructive forces released by nuclear energy.

## A2 lucas old strat

### Thorium CP

#### Thorium can’t solve meltdowns

Beránek 14

Jan Beránek (leader of Greenpeace International's Energy Campaign). “Exposing the thorium myth.” The Ecologist. 26 March 2014. JDN. http://www.theecologist.org/blogs\_and\_comments/commentators/2334778/exposing\_the\_thorium\_myth.html

The risks inherent in nuclear reactors are due to the massive concentrations of radioactive materials and the huge amount of heat they produce (which is actually needed to generate electricity). **No matter if the fuel is** based on **uranium or thorium**, if it's solid or liquid, this characteristic alone will **inevitably** continue to be the Achilles heel of any nuclear reactor. As you can read in the Union of Concerned Scientists' briefing on this issue, the truth is that the US **D**epartment **o**f **E**nergy concluded in 2009 after a review that: "the choice between uranium-based fuel and thorium-based fuel is seen basically as one of preference, with **no fundamental difference** in addressing the nuclear power issues ... "

#### Be skeptical of thorium; the industry constantly overstates new tech

Beránek 14

Jan Beránek (leader of Greenpeace International's Energy Campaign). “Exposing the thorium myth.” The Ecologist. 26 March 2014. JDN. http://www.theecologist.org/blogs\_and\_comments/commentators/2334778/exposing\_the\_thorium\_myth.html

Well, we've heard all these things from advocates of nuclear energy before, haven't we? Weren't we told in the 50's, 60's, 70's, 80's, 90's and even until recently that all these miracles would actually be delivered by uranium fueled reactors? Yeah, something obviously went wrong because none of those dreams actually came true, despite half a century's worth of effort and hundreds of billions in subsidies poured into the nuclear industry. What are the chances that replacing the Greek god with a Germanic one will help? Would Thor take his powerful hammer and nail it all down? Not likely.

#### Thorium is a pipe dream; studies, empirics, and industry consensus

Rees 11

Eifion Rees (Environmental Journalist). “Don't believe the spin on thorium being a greener nuclear option.” The Guardian. 23 June 2011. JDN. <https://www.theguardian.com/environment/2011/jun/23/thorium-nuclear-uranium>

There is a significant sticking point to the promotion of thorium as the 'great green hope' of clean energy production: it remains unproven on a commercial scale. While it has been around since the 1950s (and an experimental 10MW LFTR did run for five years during the 1960s at Oak Ridge National Laboratory in the US, though using uranium and plutonium as fuel) it is still a next generation nuclear technology – theoretical. China did announce this year that it intended to develop a thorium MSR, but nuclear radiologist Peter Karamoskos, of the International Campaign to Abolish Nuclear Weapons (ICAN), says the world shouldn't hold its breath. **'Without exception, [thorium reactors] have never been commercially viable**, nor do any of the intended new designs even remotely seem to be viable. Like all nuclear power production they rely on extensive taxpayer subsidies; the only difference is that with thorium and other breeder reactors these are of an order of magnitude greater, which is why no government has ever continued their funding.' China's development will persist until it experiences the ongoing major technical hurdles the rest of the nuclear club have discovered, he says. Others see thorium as a smokescreen to perpetuate the status quo: the world's only operating thorium reactor – India's Kakrapar-1 – is actually a converted PWR, for example. 'This could be seen to excuse the continued use of PWRs until thorium is [widely] available,' points out Peter Rowberry of No Money for Nuclear (NM4N) and Communities Against Nuclear Expansion (CANE). In his reading, thorium is merely a way of deflecting attention and criticism from the dangers of the uranium fuel cycle and excusing the pumping of more money into the industry. And yet **the nuclear industry itself is also sceptical, with none of the big players backing** what should be – in PR terms and in a post-Fukushima world – its radioactive holy grail: safe reactors producing more energy for less and cheaper fuel. In fact, a 2010 National Nuclear Laboratory (NNL) report concluded the thorium fuel cycle 'does not currently have a role to play in the UK context [and] is likely to have only a limited role internationally for some years ahead' – in short, it concluded, the claims for thorium were 'overstated'. Proponents counter that the NNL paper fails to address the question of MSR technology, evidence of its bias towards an industry wedded to PWRs. Reliant on diverse uranium/plutonium revenue streams – fuel packages and fuel reprocessing, for example – the nuclear energy giants will never give thorium a fair hearing, they say. But even were its commercial viability established, given 2010's soaring greenhouse gas levels, thorium is one magic bullet that is years off target. Those who support renewables say they will have come so far in cost and efficiency terms by the time the technology is perfected and upscaled that thorium reactors will already be uneconomic. Indeed, if renewables had a fraction of nuclear's current subsidies they could already be light years ahead.

**PREFER BECAUSE MORE RECENT MEANS THAT THERE HAVE BEEN MORE STUDIES AND STUFF**

### Coal DA

#### Uniqueness overwhelms the link. The Paris agreement ensures that we will not switch to coal. Countries are already moving away and starting to comply. The impact of the DA will never happen.

#### Mileusnic 8-24-16

Mileusnic, Dragona. "The Future of Coal Is Grim, after the Paris Agreement." Center for International Relations and Sustainable Development. N.p., 24 Aug. 2016. Web. 26 Aug. 2016. <http://www.cirsd.org/en/blog/the-future-of-coal-is-grim-after-the-paris-agreement> CP MLT

Over the past several years, the impacts of climate change have become more visible across the globe. Unprecedented floods hit Southeast Europe in 2014, while 2015 was yet another hottest year on record worldwide. Such events set the stage for the discussion on the new international climate regime, for the period after 2020. The UN Climate Summit held in Paris last December was in many ways historic; and so were the trends leading to it and the developments unfolding in the months thereafter. Several factors enabled Paris to become a success. The green energy industry is flourishing and renewable technologies have become readily available in many developed and developing countries. These trends have strengthened global efforts to divest from fossil fuels, in favour of a complete switch to renewable energy sources. Along with a growing recognition by most of the developing countries that action needs to be taken now to rescue their chances for further development, these were the factors necessary for the success of Paris. Because of this, and the fact that over 190 countries agreed to it, the Paris Agreement actually has a historic character. In Paris, countries agreed to hold the increase in global average temperature “to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C”, as well as to bring greenhouse gas emissions down to net zero during the second part of this century. Knowing that scientific studies have found that 88% of the world's coal reserves should remain under the ground, in order to stay even below 2 ° C warming, it is clear that the target of 1.5 ° C requires speedy and decisive action. This means that after Paris, there is no real long-term future for the global coal industry. **So what comes after Paris?** After Paris, everyone has to act in order to enable the proper implementation of the Agreement. The role of non-state actors will be particularly important in the years to come, as Paris calls for a total shift of financial flows away from coal, oil and gas consumption. More importantly, various stakeholders have started to act and are actually spearheading climate action in the EU. While the European Commission still deliberates its course of action, a group of businesses, cities, regions, investors, trade unions, civil society groups and other stakeholders has demonstrated its readiness to support the objectives of the Paris Agreement. Climate Action Network Europe, together with Prince of Wales' Corporate Leaders’ Group, the European Trade Union Confederation and other stakeholders has launched a Coalition for Higher Ambition, calling on the EU to start responding to Paris adequately. What we expect to see now is the development of a robust European policy framework, which will allow the EU to become a zero carbon economy. Its current climate and energy targets are too low to reach the goals of the Paris Agreement and need to be tightened. Europe needs to stimulate long-term investments in low carbon technologies, in particular energy efficiency and renewable energy, as well as in sustainable agriculture and the protection and restoration of our ecosystems. Europe should develop an innovative European market that will allow all European leaders, citizens and workers to benefit in terms of good quality jobs, sustainable growth, improved competitiveness and better public health, while ensuring a just transition for the workforce. Europe also needs to continue demonstrating international leadership by securing early ratification of Paris and working with other countries to support their delivery of the Paris Agreement. 2016 is a critical year for the implementation of the Paris Agreement as well as the Sustainable Development Goals through the development of EU legislation that will bring the EU’s 2030 climate and energy package to life. It must not be forgotten that 2016 is also the year of the delivery of the Energy Union, another initiative launched by this European Commission. Commission President Juncker has already flagged that Europe must become a global leader in renewable energy. We hope that 2016 helps us move a step closer towards this goal. This will not be an easy task knowing that China has achieved two world records last year: it built 32.5 gigawatts (GW) of wind power, and installed 18.3 GW of solar power, leaving the EU far behind. Chinese renewable energy production is growing fast, while coal consumption is going down.

#### Prefer my evidence because it is from three days ago meaning the agreement happened after their uniqueness evidence. The Paris Agreement destroys this DA.

#### The DA is Nonunique. There are other major causes of global warming. You can never prove that the aff is actually triggering the impacts. Err aff on the DA because global warming is going to happen in a world where the aff isn’t passed, anyway.

#### Scientific American 12

"Deforestation and Its Extreme Effect on Global Warming." *Scientific American*. N.p., 13 Nov. 2012. Web. 26 Aug. 2016.

<http://www.scientificamerican.com/article/deforestation-and-global-warming/> CP MLT

By most accounts, deforestation in tropical rainforests adds more carbon dioxide to the atmosphere than the sum total of cars and trucks on the world’s roads. According to the World Carfree Network (WCN), cars and trucks account for about 14 percent of global carbon emissions, while most analysts attribute upwards of 15 percent to deforestation. The reason that logging is so bad for the climate is that when trees are felled they release the carbon they are storing into the atmosphere, where it mingles with greenhouse gases from other sources and contributes to global warming accordingly. The upshot is that we should be doing as much to prevent deforestation as we are to increase fuel efficiency and reduce automobile usage. According to the Environmental Defense Fund (EDF), a leading green group, 32 million acres of tropical rainforest were cut down each year between 2000 and 2009—and the pace of deforestation is only increasing. “Unless we change the present system that rewards forest destruction, forest clearing will put another 200 billion tons of carbon into the atmosphere in coming decades…,” says EDF. “Any realistic plan to reduce global warming pollution sufficiently—and in time—to avoid dangerous consequences must rely in part on preserving tropical forests,” reports EDF. But it’s hard to convince the poor residents of the Amazon basin and other tropical regions of the world to stop cutting down trees when the forests are still worth more dead than alive. “Conservation costs money, while profits from timber, charcoal, pasture and cropland drive people to cut down forests,” adds EDF. Exacerbating global warming isn’t the only negative impact of tropical deforestation. It also wipes out biodiversity: More than half of the world’s plant and animal species live in tropical rainforests. One way some tropical countries are reducing deforestation is through participation in the United Nations’ Reducing Emissions from Deforestation and Forest Degradation (REDD) program. REDD essentially works to establish incentives for the people who care for the forest to manage it sustainably while still being able to benefit economically. Examples include using less land (and therefore cutting fewer trees) for activities such as coffee growing and meat and milk production. Participating nations can then accrue and sell carbon pollution credits when they can prove they have lowered deforestation below a baseline. The REDD program has channeled over $117 million in direct financial aid and educational support into national deforestation reduction efforts in 44 developing countries across Africa, Asia and Latin America since its 2008 inception. Brazil is among the countries embracing REDD among other efforts to reduce carbon emissions. Thanks to the program, Brazil has slowed deforestation within its borders by 40 percent since 2008 and is on track to achieve an 80 percent reduction by 2020. Environmentalists are optimistic that the initial success of REDD in Brazil bodes well for reducing deforestation in other parts of the tropics as well.

## A2 security

#### Inevitable

#### Alt washes over tangible oppression

Extensions:

Extend bohmer 91 it contextualizes the heuristic of debate as one where debaters are needed to challenge oppressive structures because without this model the problems will only be replicated elsewhere.

Extend mills 2 – non ideal theory is preferable because ambiguous meta ethics or Util calculus ignore social identity and histories of injustice and have the potential to replicate.

Extend curry 14 – debate as an activity needs to use non ideal theory to avoid idealized action points. Real world discussions and access points beg the question of oppression centered framework and understanding the values of tangible effects though this stasis point.

Extend Connelly – pure left critiques might be important to acknowledge problems but won't be able to change their impacts. Functioning under the guise of the state without being statist is necessary to change tangible forms of oppression and impacts.

## A2 consult natives

#### consultation wouldn’t have already happened – theres been proof in the squo that the government doesn t listen to their needs or wishes – that started centuries ago. Terminal defense

#### perm do the aff then the CP we can fully ban nuclear power and then consult native tribes if they wish to keep it during the phase out process.

#### perm do the aff